CALIFORNIA HIGH-SPEED TRAIN

Technical Report

DRAFT

Fresno to Bakersfield Section **Transportation Analysis**

August 2011

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

Transportation Analysis Technical Report

Prepared by:

URS/HMM/Arup Joint Venture

August 2011

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Note: Because this report incorporates such a large number of figures, all but seven of them are provided in a "Figures" section at the end of the text (and before the appendices). The exceptions are the figures that are part of Chapters 1 and 2. Those seven figures appear on the pages in those two chapters.

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Acronyms

ADT	average daily traffic
Authority	California High-Speed Rail Authority
BNSF	BNSF Railway (formerly Burlington Northern Santa Fe Railway)
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
E.	east
EIR	environmental impact report
EIS	environmental impact statement
FCH	Fresno Chandler Downtown Airport
FRA	Federal Railroad Administration
Fresno COG	Council of Fresno County Governments
FYI	Fresno Yosemite International Airport
GET	Golden Empire Transit
HCM	Highway Capacity Manual
HST	high-speed train
I	Interstate
KART	Kings Area Rural Transit
KCAPTA	Kings County Area Public Transit Agency
LOS	level of service
N.	north
NEPA	National Environmental Policy Act
RTIP	Regional Transportation Improvement Plan
S.	south
SJVRR	San Joaquin Valley Railroad
SR	State Route
TDM	Transportation Demand Management
TOD	transit-oriented development
U.S.	United States
U.S.C.	United States Code
V/C	volume to capacity
W.	west

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Chapter 1
Introduction

1.0 Introduction

This report is designed to provide a technical foundation for the transportation impact analysis presented in the environmental impact report/environmental impact statement (EIR/EIS) that was prepared for the Fresno to Bakersfield Section of the California High-Speed Train (HST) System.

The California High-Speed Rail Authority (Authority) proposes to construct, operate, and maintain an electric-powered HST System in California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90% of the state's population. More than 200 weekday trains would serve the statewide intercity travel market. The HST would be capable of operating at speeds of up to 220 miles per hour (mph), with state-of-the-art safety, signaling, and automated train control systems. The system would connect and serve the major metropolitan areas of California, extending from San Francisco and Sacramento in the north to San Diego in the south.

In 2005, the Authority and the Federal Railroad Administration (FRA) prepared a Program Environmental Impact Report/Environmental Impact Statement (Statewide Program EIR/EIS) evaluating the HST's ability to meet the existing and future capacity demands on California's intercity transportation system (Authority and FRA 2005). This was the first phase of a tiered environmental review process (Tier 1) for the proposed statewide HST System. The Authority and the FRA completed a second Program EIR/EIS in July 2008 to identify a preferred alignment for the Bay Area to Central Valley section (Authority and FRA 2008).

The Authority and FRA are now undertaking second-tier, project environmental evaluations for sections of the statewide HST System. This technical report is for the Fresno to Bakersfield Section, which begins at the proposed Fresno HST station in Downtown Fresno and extends east past the proposed Bakersfield HST station in Downtown Bakersfield for approximately 1 mile to Oswell Street. Information from this report is summarized in the project EIR/EIS for the Fresno to Bakersfield HST Section and will be part of the administrative record supporting the environmental review of the proposed project.

For the HST System, including the Fresno to Bakersfield Section, the FRA is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and other federal laws. The Authority is serving as a joint-lead agency under NEPA and is the lead agency for compliance with the California Environmental Quality Act (CEQA). The U.S. Army Corps of Engineers (USACE) is serving as a cooperating agency under NEPA for the Fresno to Bakersfield Section. The planning, design, construction, and operation of the California HST System are the responsibility of the Authority, a state governing board formed in 1996. The Authority's statutory mandate is to develop a high-speed rail system that is coordinated with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports. The Authority's plans call for high-speed intercity train service on more than 800 miles of tracks throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego (Figure 1-1).

Map based on 2005 Statewide Programmatic EIR/S preferred route, and staff recommendation to Authority Board December 19, 2007
Mapping Sources: US Census 2000; CA Dept. of Conservation, Farmland Mapping and Monitoring Program 2000;
California Resources Agency Legacy Project 2002; CA Dept. of Fish and Game 1999

California High-Speed Train Program EIR/EIS	Initial Study Corridors	Figure 1-1

The California HST System is planned to be implemented in two phases. Phase 1 would connect San Francisco to Los Angeles and Anaheim via the Pacheco Pass and the Central Valley. Phase 2 would connect from the Central Valley (Merced Station) to the state's capital, Sacramento, and would plan another extension from Los Angeles to San Diego (Figure 1-1). The HST System would meet the requirements of Proposition 1A, including the requirement for a maximum nonstop service travel time between San Francisco and Los Angeles of 2 hours and 40 minutes.

The Fresno to Bakersfield HST Section would be a critical portion of the Phase 1 HST link connecting San Francisco and the Bay Area to Los Angeles and Anaheim. The Authority and the FRA selected the BNSF Railway route as the preferred alternative for the Central Valley HST between Fresno and Bakersfield in the 2005 Statewide Program EIR/EIS decision documents (Authority and FRA 2005).

Chapter 2
Project Description

2.0 Project Description

2.1 Project Introduction

The Fresno to Bakersfield Section of the HST project would be approximately 114 miles long, varying in length by only a few miles based on the route alternatives selected. To comply with the Authority's guidance to use existing transportation corridors when feasible, the Fresno to Bakersfield HST Section would be primarily located adjacent to the existing BNSF Railway right-of-way. Alternative alignments are being considered where engineering constraints require deviation from the existing railroad corridor, and to avoid environmental impacts.

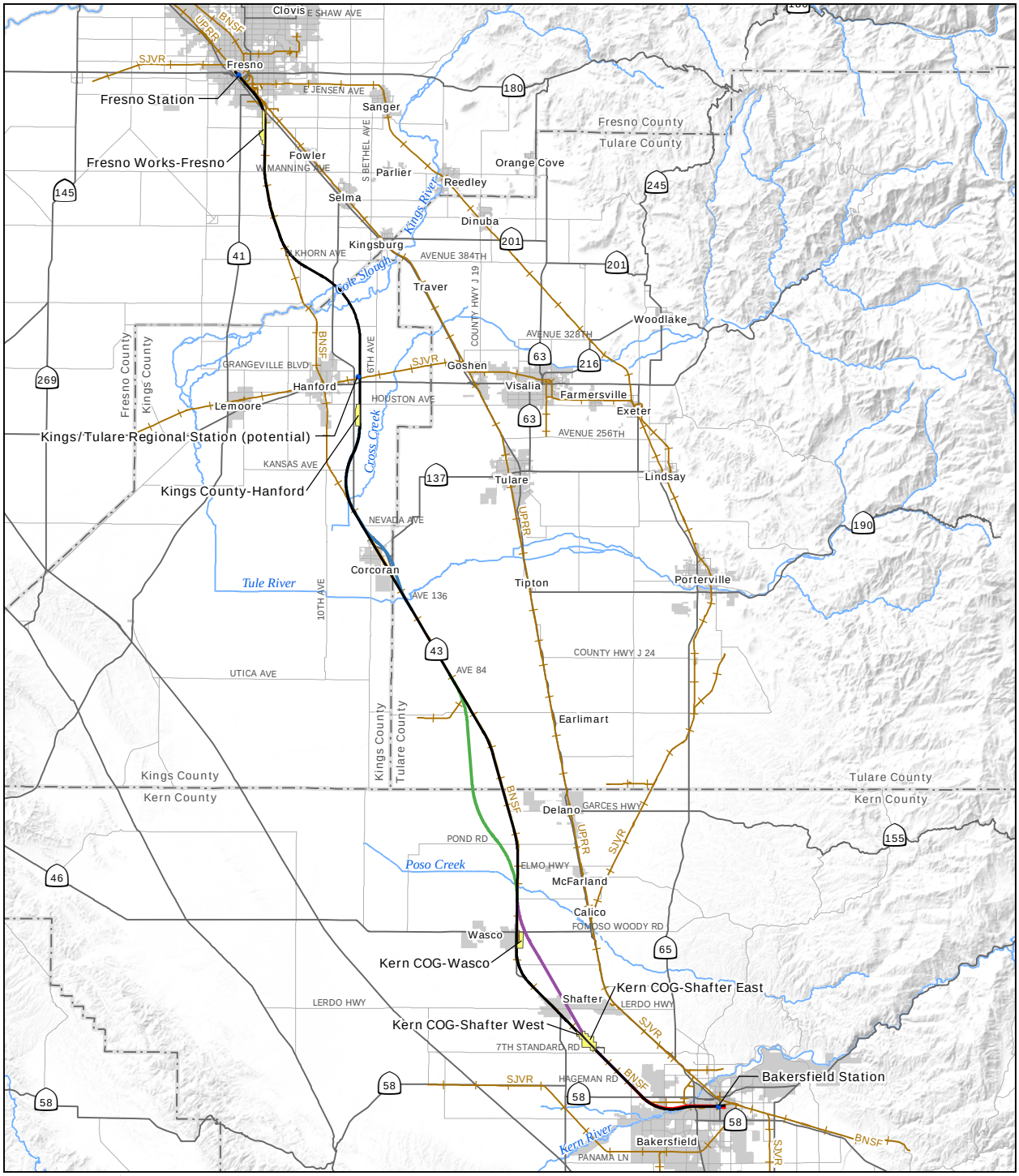
The Fresno to Bakersfield HST Section would cross both urban and rural lands and include a station in both Fresno and Bakersfield, a potential Kings/Tulare Regional Station in the vicinity of Hanford, a potential heavy maintenance facility (HMF), and power substations along the alignment. The HST alignment would be entirely grade-separated, meaning that crossings with roads, railroads, and other transport facilities would be located at different heights (overpasses or underpasses) so that the HST would not interrupt nor interface with other modes of transport. The HST right-of-way would also be fenced to prohibit public or automobile access. The project footprint would consist primarily of the train right-of-way, which would include both a northbound and southbound track in an area typically 100 feet wide. Additional right-of-way would be required to accommodate stations, multiple track at stations, maintenance facilities, and power substations.

The Fresno to Bakersfield Section would include at-grade, below-grade, and elevated track segments. The at-grade track would be laid on an earthen rail bed topped with rock ballast approximately 6 feet off of the ground; fill and ballast for the rail bed would be obtained from permitted borrow sites and quarries. Below-grade track would be laid in an open or covered trench at a depth which would allow roadway and other grade-level uses above the track. Elevated track segments would span long sections of urban development or aerial roadway structures and consist of steel truss aerial structures with cast in place reinforced-concrete columns supporting the box girders and platforms. The height of elevated track sections would depend on the height of existing structures below, and would range from 40 to 80 feet. Columns would be spaced 60 feet to 120 feet apart.

2.2 Project Alternatives

2.2.1 Alignment Alternatives

This section describes the Fresno to Bakersfield HST Section project alternatives, including the No Project Alternative. The project EIR/EIS for the Fresno to Bakersfield HST Section examines alternative alignments, stations, and HMF sites within the general BNSF Railway corridor. Discussion of the HST project alternatives begins with a single continuous alignment (the BNSF Alternative) from Fresno to Bakersfield. This alternative most closely aligns with the preferred alignment identified in the Record of Decision (ROD) for the Statewide Program EIR/EIS. Descriptions of the additional five alternative alignments that deviate from the BNSF Alternative for portions of the route then follow. The alternative alignments that deviate from the BNSF Alternative were selected to avoid environmental, land use, or community issues identified for portions of the BNSF Alternative (Figure 2-1).



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

May 16, 2011

Source: URS, 2011

- BNSF Alternative
- Corcoran Elevated
- Corcoran Bypass
- Allensworth Bypass
- Wasco-Shafter Bypass
- Bakersfield South
- Station location
- Alternative heavy maintenance facility (HMF)
- Stream
- Existing rail line
- Community/Urban area
- County boundary

N

0 5 10 Miles

0 10 20 Kilometers

Figure 2-1
Fresno to Bakersfield HST alignments

A. NO PROJECT ALTERNATIVE

Under the No Project Alternative, the HST System would not be built. The No Project Alternative represents the condition of the Fresno to Bakersfield Section as it existed in 2009 (when the Notice of Preparation was issued), and as it would exist without the HST project at the planning horizon (2035). To assess future conditions, it was assumed that all currently known programmed and funded improvements to the intercity transportation system (highway, rail, and transit), and reasonably foreseeable local development projects (with funding sources identified), would be developed by 2035. The No Project Alternative is based on a review of Regional Transportation Plans (RTPs) for all modes of travel, the State of California Office of Planning and Research CEQAnet Database, the Federal Aviation Administration Air Carrier Activity Information System and Airport Improvement Plan grant data, the State Transportation Improvement Program, airport master plans and interviews with airport officials, intercity passenger rail plans, and city and county general plans and interviews with planning officials.

B. BNSF ALTERNATIVE ALIGNMENT

The BNSF Alternative Alignment would extend approximately 114 miles from Fresno to Bakersfield and would lie adjacent to the BNSF Railway route to the extent feasible (Figure 2-1). Minor deviations from the BNSF Railway corridor would be necessary to accommodate engineering constraints, namely wider curves necessary to accommodate the HST (as compared with the existing lower-speed freight line track alignment). The largest of these deviations occurs between approximately Elk Avenue in Fresno County and Nevada Avenue in Kings County. This segment of the BNSF Alternative would depart from BNSF Railway corridor and instead curve to the east on the northern side of the Kings River and away from Hanford, and would rejoin the BNSF Railway corridor north of Corcoran.

Although the majority of the alignment would be at-grade, the BNSF Alternative would include elevated structures in all of the four counties through which it travels. In Fresno County, an elevated structure would carry the alignment over Golden State Boulevard and SR 99 and a second would cross over the BNSF Railway tracks in the vicinity of E. Conejo Avenue. The alignment would be at-grade with bridges where it crosses Cole Slough and the Kings River into Kings County.

In Kings County, the BNSF Alternative would be elevated east of Hanford where the alignment would pass over the San Joaquin Valley Railroad and SR 198. The alignment would also be elevated over Cross Creek, and again at the southern end of the city of Corcoran to avoid a BNSF Railway spur. In Tulare County, the BNSF Alternative would be elevated at the crossing of the Tule River and at the crossing of the Alpaugh railroad spur that runs west from the BNSF Railway mainline. The BNSF Alternative would be elevated in Kern County across both Poso Creek and the Kern River continuing through the city of Bakersfield.

The BNSF Alternative Alignment would provide wildlife crossing opportunities by means of a variety of engineered structures. Dedicated wildlife crossing structures would be provided from approximately Cross Creek (Kings County) south to Poso Creek (Kern County) in at-grade portions of the railroad embankment at approximately 0.3-mile intervals. In addition to those structures, wildlife crossing opportunities would be available at elevated portions of the alignment, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large diameter [60 to 120 inches] culverts and paired 30-inch culverts). Where bridges, aerial structures, and road crossings coincide with proposed dedicated wildlife crossing structures, such features would serve the function of, and supersede the need for, dedicated wildlife crossing structures.

The preliminary wildlife crossing structure design consists of a modified culvert in the embankment that would support the HST tracks. The typical culvert would be 72 feet long from end to end (crossing structure distance), would span a width of approximately 8 feet (crossing structure width), and would provide 4 feet of vertical clearance (crossing structure height). Additional wildlife crossing structure designs could include circular or elliptical pipe culverts, and larger (longer) culverts with crossing structure distances of up to 100 feet. The design of the wildlife crossing structures may change depending on site-specific conditions and engineering considerations.

C. CORCORAN ELEVATED ALTERNATIVE ALIGNMENT

The Corcoran Elevated Alternative Alignment would be the same as the corresponding section of the BNSF Alternative Alignment except that it would pass through the city of Corcoran on the eastern side of the BNSF Railway right-of-way on an elevated structure. The elevated structure would reach a maximum height of approximately 40 feet to the top of the rail. Dedicated wildlife crossing structures would be provided from approximately Cross Creek south to Avenue 136 in at-grade portions of the railroad embankment at intervals of approximately 0.3 mile. Dedicated wildlife crossing structures would also be placed between 100 and 500 feet to the north and south of both the Cross Creek and Tule River crossings.

This alternative alignment would cross SR 43 and pass over several local roads on an aerial structure. Sante Fe Avenue would be closed at the HST right-of-way.

D. CORCORAN BYPASS ALTERNATIVE ALIGNMENT

The Corcoran Bypass Alternative Alignment would run parallel to the BNSF Alternative Alignment from approximately Idaho Avenue south of Hanford, to approximately Nevada Avenue north of Corcoran. The Corcoran Bypass Alternative would then diverge from the BNSF Alternative and swing east of Corcoran, rejoining the BNSF Railway route at Avenue 136. The total length of the Corcoran Bypass would be approximately 21 miles.

Similar to the corresponding section of the BNSF Alternative, most of the Corcoran Bypass Alternative would be at-grade. However, two elevated structures would carry the HST over Cross Creek and the Tule River. Dedicated wildlife crossing structures would be provided from approximately Cross Creek south to Avenue 136 in at-grade portions of the railroad embankment at intervals of approximately 0.3 mile. Dedicated wildlife crossing structures would also be placed between 100 and 500 feet to the north and south of each of the Cross Creek and Tule River crossings.

This alternative alignment would cross SR 43, Whitley Avenue/SR 137, and several local roads. SR 43, Waukena Avenue, and Whitley Avenue would be grade-separated from the HST with an overcrossing/undercrossing; other roads would be closed at the HST right-of-way.

E. ALLENSWORTH BYPASS ALTERNATIVE ALIGNMENT

The Allensworth Bypass Alternative Alignment would pass west of the BNSF Alternative, avoiding Allensworth Ecological Reserve and the Allensworth State Historic Park. This alignment was refined over the course of environmental studies to reduce impacts to wetlands and orchards. The total length of the Allensworth Bypass Alternative Alignment would be approximately 19 miles, beginning at Avenue 84 and rejoining the BNSF Alternative at Elmo Highway.

The Allensworth Bypass Alternative would be constructed on an elevated structure only where the alignment crosses the Alpaugh railroad spur. The alignment would pass through Tulare County mostly at-grade. Dedicated wildlife crossing structures would be provided from approximately Avenue 84 to Poso Creek at intervals of approximately 0.3 mile. Dedicated wildlife

crossing structures would also be placed between 100 and 500 feet to the north and south of both the Deer Creek and Poso Creek crossings.

The Allensworth Bypass would cross County Road J22, Scofield Avenue, Garces Highway, Woollomes Avenue, Magnolia Avenue, Palm Avenue, Pond Road, Peterson Road, and Elmo Highway. Woollomes Avenue and Elmo Highway would be closed at the HST right-of-way, while the other roads would be realigned or grade-separated from the HST with overcrossings.

The Allensworth Bypass Alternative includes an option to relocate the existing BNSF Railway tracks to be adjacent to the HST right-of-way for the length of this alignment. The possibility of relocating the BNSF Railway tracks along this alignment has not yet been discussed with BNSF Railway; however, if this option is selected, it is assumed that the existing BNSF Railway right-of-way would be abandoned between Avenue 84 and Elmo Highway, and the relocated BNSF Railway right-of-way would be 100 feet wide and adjacent to the eastern side of the Allensworth Bypass Alternative right-of-way.

F. WASCO-SHAFTER BYPASS ALTERNATIVE ALIGNMENT

The Wasco-Shafter Bypass Alternative Alignment would diverge from the BNSF Alternative between Sherwood Avenue and Fresno Avenue, crossing over to the eastern side of the BNSF Railway tracks and bypassing Wasco and Shafter to the east. The Wasco-Shafter Bypass Alternative would rejoin the BNSF Alternative at 7th Standard Road. The total length of the alternative alignment would be approximately 24 miles, and the alignment would be at-grade.

The Wasco-Shafter Bypass was refined to avoid the Occidental Petroleum tank farm as well as a historic property potentially eligible for listing on the National Register of Historic Places. The Wasco-Shafter Bypass would cross SR 43, SR 46, East Lerdo Highway, and several local roads. SR 46, Kimberlina Road, Shafter Avenue, Beech Avenue, Cherry Avenue, and Kratzmeyer Road would be grade-separated from the HST with overcrossings/undercrossings; other roads would be closed at the HST right-of-way.

G. BAKERSFIELD SOUTH ALTERNATIVE ALIGNMENT

From the Rosedale Highway (SR 58) in Bakersfield, the Bakersfield South Alternative Alignment would run parallel to the BNSF Alternative Alignment at varying distances to the north. At Chester Avenue, the Bakersfield South Alternative curves south, and runs parallel to California Avenue. As with the BNSF Alternative, the Bakersfield South Alternative would begin at-grade but then be elevated starting at Palm Avenue through Bakersfield to its terminus at the southern end of the Bakersfield station tracks. The elevated section would range in height from 50 to 70 feet. Dedicated wildlife crossing structures would be placed between 100 and 500 feet to the north and south of the Kern River.

The Bakersfield South Alternative would be approximately 9 miles long and would cross the same roads as the BNSF Alternative. This alternative includes the Bakersfield Station–South Alternative.

2.2.2 Station Alternatives

The Fresno to Bakersfield HST Section would include a new station in Fresno and a new station in Bakersfield. An optional third station, the Kings/Tulare Regional Station, is under consideration.

Stations would be designed to address the purpose of the HST, particularly to allow for intercity travel and connection to local transit, airports, and highways. Stations would include the station platforms, a station building and associated access structure, as well as lengths of bypass tracks to accommodate local and express service at the stations. All stations would contain the following elements:

- Passenger boarding and alighting platforms.
- Station head house with ticketing, waiting areas, passenger amenities, vertical circulation, administration and employee areas, and baggage and freight-handling service.
- Vehicle parking (short-term and long-term) and "kiss and ride".
- Motorcycle/scooter parking.
- Bicycle parking.
- Waiting areas and queuing space for taxis and shuttle buses.
- Pedestrian walkway connections.

A. FRESNO STATION ALTERNATIVES

Two alternative sites are under consideration for the Fresno Station.

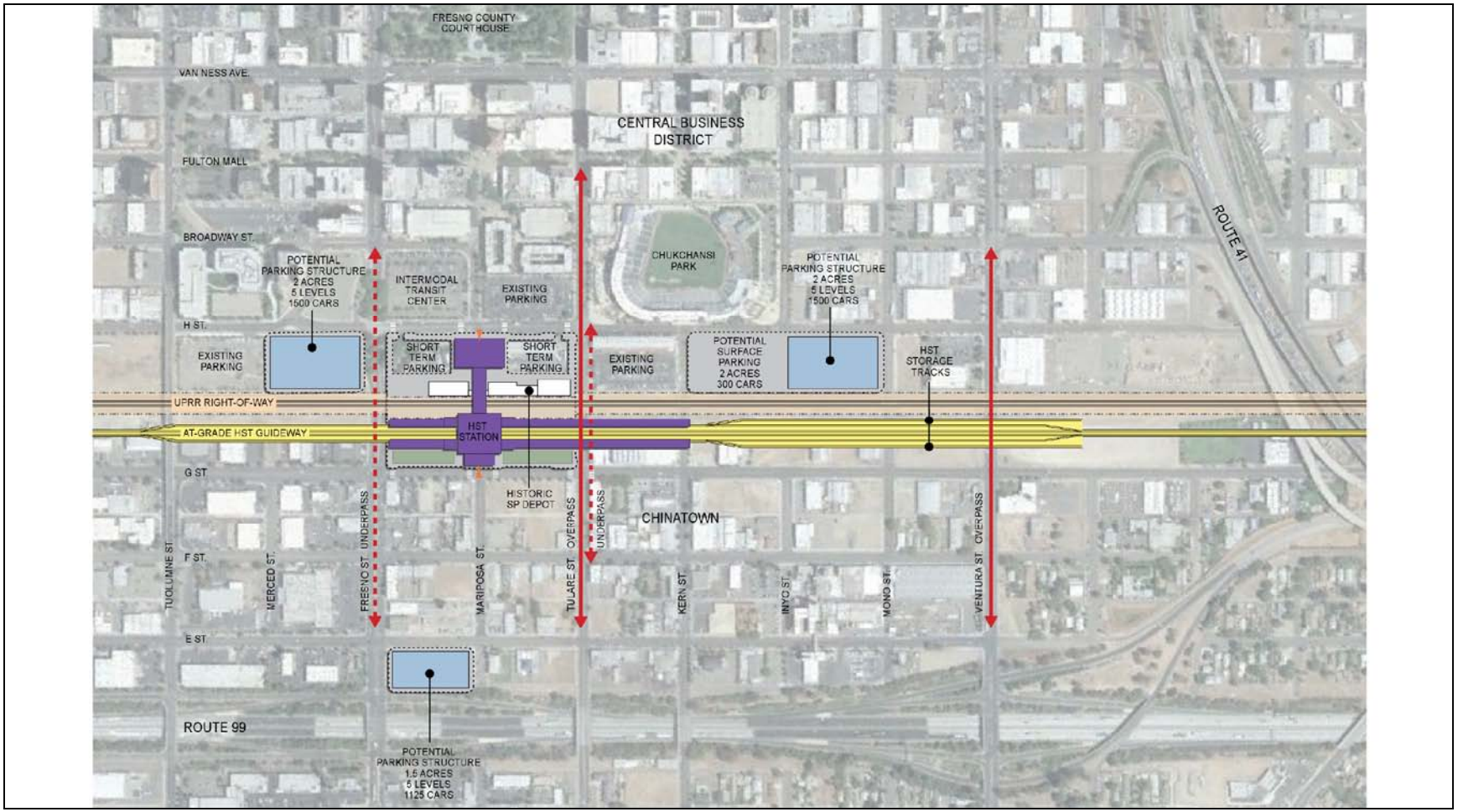
Fresno Station–Mariposa Alternative

The Fresno Station–Mariposa Alternative would be in Downtown Fresno, less than 0.5 mile east of SR 99 on the BNSF Alternative. The station would be centered on Mariposa Street and bordered by Fresno Street on the north, Tulare Street on the south, H Street on the east, and G Street on the west. The station building would be approximately 75,000 square feet, with a maximum height of approximately 64 feet.

The two-level station would be at-grade; with passenger access provided both east and west of the HST guideway and the UPRR tracks, which would run parallel with one another adjacent to the station. The first level would contain the public concourse, passenger service areas, and station and operation offices. The second level would include the mezzanine, a pedestrian overcrossing above the HST guideway and the UPRR tracks, and an additional public concourse area. Entrances would be located at both G and H streets. A conceptual site plan of the Fresno Station–Mariposa Alternative is provided in Figure 2-2.

The majority of station facilities would be east of the UPRR tracks. The station and associated facilities would occupy approximately 20.5 acres, including 13 acres dedicated to the station, short term parking, and kiss-and-ride accommodations. A new intermodal facility, not a part of this proposed undertaking, would be located on the parcel bordered by Fresno Street to the north, Mariposa Street to the south, Broadway Street to the east, and H Street to the west (designated "Intermodal Transit Center" in Figure 2-2). Among other uses, the intermodal facility would accommodate the Greyhound facilities and services that would be relocated from the northwestern corner of Tulare and H streets.

The site proposal includes the potential for up to three parking structures occupying a total of approximately 5.5 acres. Two of the three potential parking structures would each sit on 2 acres, and each would have a capacity of approximately 1,500 cars. The third parking structure would be slightly smaller in footprint (1.5 acres), with five levels and a capacity of approximately 1,100 cars. An additional 2-acre surface parking lot would provide approximately 300 parking spaces.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

May 16, 2011

STATION ENTRANCE

KEY PEDESTRIAN LINKAGE

OPEN SPACE

STATION CAMPUS BOUNDARY

RIGHT-OF-WAY BOUNDARY

ROADWAY MODIFICATION

NOT TO SCALE

Figure 2-2
Fresno Station-Mariposa Alternative

Under this alternative, the historic Southern Pacific Railroad depot and associated Pullman Sheds would remain intact. While these structures could be used for station-related purposes, they are not assumed to be functionally required for the HST project and are thus, not proposed to be physically altered as part of the project. The Mariposa station building footprint has been configured to preserve views of the historic railroad depot and associated sheds.

Fresno Station–Kern Alternative

The Fresno Station–Kern Alternative would be similarly situated in Downtown Fresno and would be located on the BNSF Alternative, centered on Kern Street between Tulare Street and Inyo Street (Figure 2-3). This station would include the same components as the Fresno Station–Mariposa Alternative, but under this alternative, the station would not encroach on the historic Southern Pacific Railroad depot just north of Tulare Street and would not require relocation of existing Greyhound facilities.

The station building would be approximately 75,000 square feet, with a maximum height of approximately 64 feet. The station building would have two levels housing the same facilities as the Fresno Station–Mariposa Alternative (UPRR tracks, HST tracks, mezzanine, and station office). The approximately 18.5-acre site would include 13 acres dedicated to the station, bus transit center, short term parking, and kiss-and-ride accommodations.

Two of the three potential parking structures would each sit on 2 acres, and each would have a capacity of approximately 1,500 cars. The third structure would be slightly smaller in footprint (1.5 acres) and have a capacity of approximately 1,100 cars. Surface parking lots would provide approximately 600 additional parking spaces. Like the Fresno Station–Mariposa Alternative, the majority of station facilities under the Kern Alternative would be sited east of the HST tracks.

B. KINGS/TULARE REGIONAL STATION

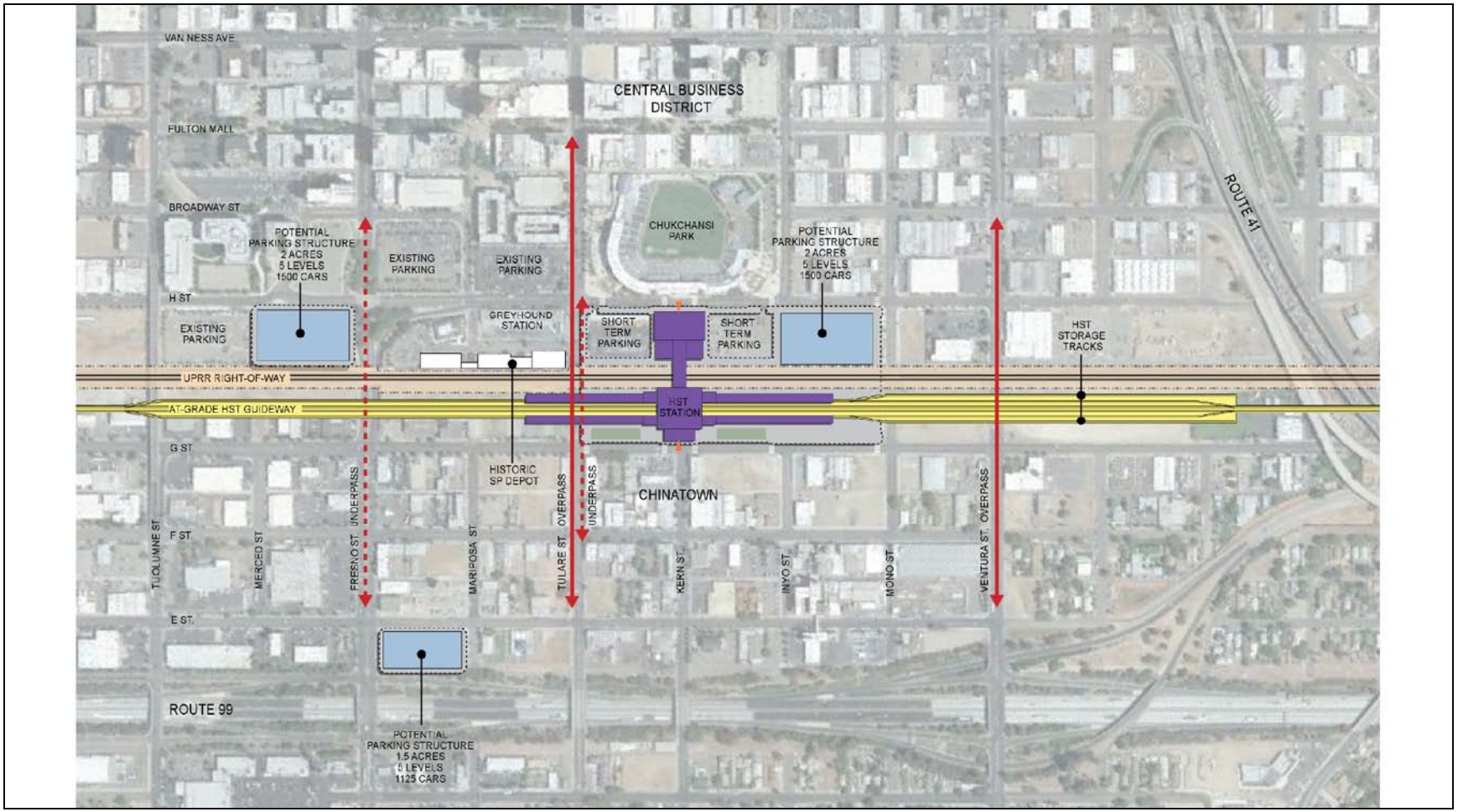
The potential Kings/Tulare Regional Station would be located east of SR 43 (Avenue 8) and north of the Cross Valley Rail Line (San Joaquin Valley Railroad) (Figure 2-4). The station building would be approximately 40,000 square feet with a maximum height of approximately 75 feet. The entire site would be approximately 27 acres, including 8 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride. An additional approximately 19 acres would support a surface parking lot with approximately 1,600 spaces.

C. BAKERSFIELD STATION ALTERNATIVES

Two options are under consideration for the Bakersfield Station.

Bakersfield Station–North Alternative

The Bakersfield Station–North Alternative would be located at the corner of Truxtun and Union Avenue/SR 204 along the BNSF Alternative Alignment (Figure 2-5). The three-level station building would be 52,000 square feet, with a maximum height of approximately 95 feet. The first level would house station operation offices and would also accommodate trains running along the BNSF Railway line. The second level would include the mezzanine; the HST platforms and guideway would pass through the third level. Under this alternative, the station building would be located at the western end of the parcel footprint. Two new boulevards would be constructed to access the station and the supporting facilities.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

May 16, 2011

STATION ENTRANCE

KEY PEDESTRIAN LINKAGE

OPEN SPACE

STATION CAMPUS BOUNDARY

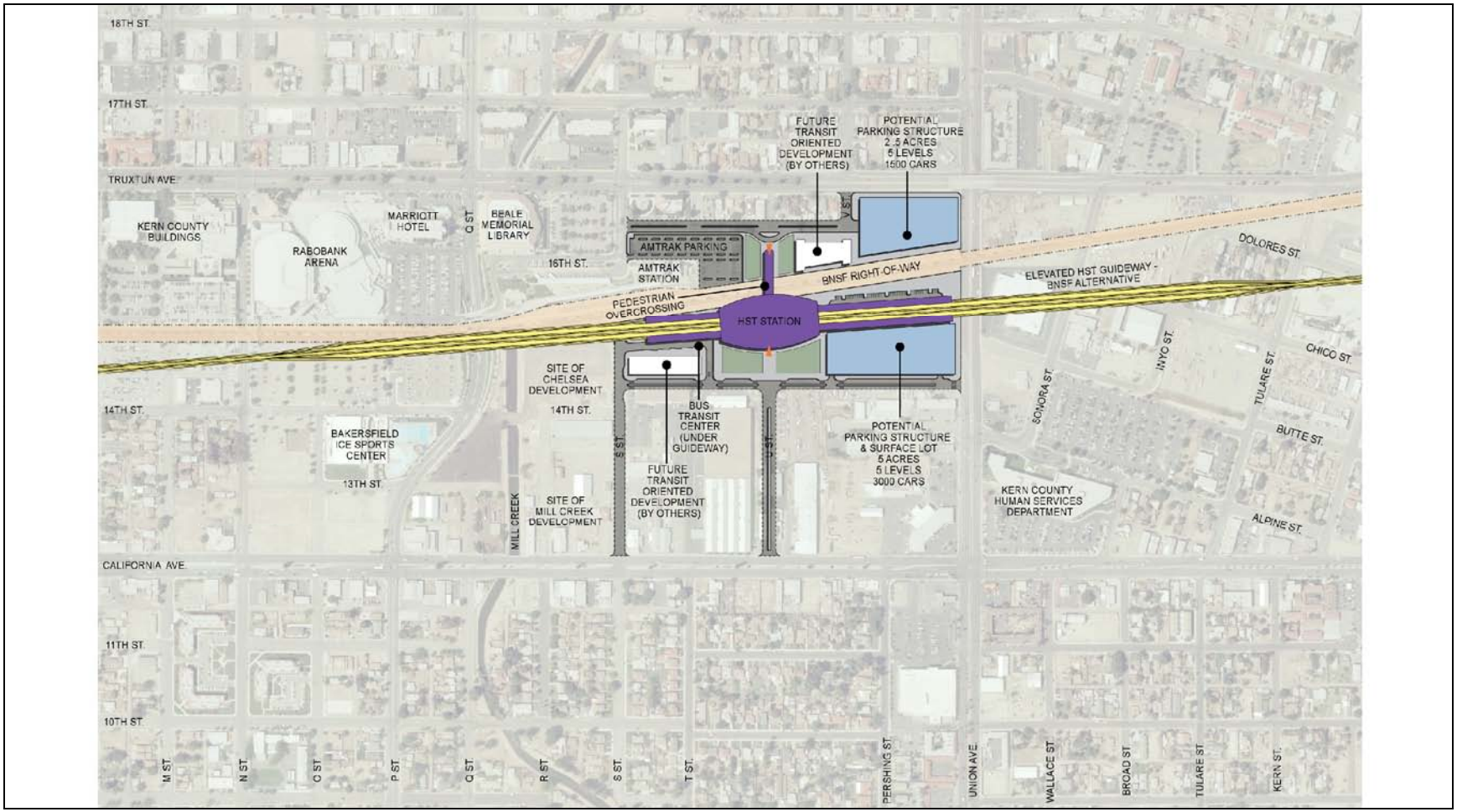
RIGHT-OF-WAY BOUNDARY

ROADWAY MODIFICATION

NOT TO SCALE

Figure 2-3
Fresno Station-Kern Alternative

Figure 2-4
Kings/Tulare Regional Station (potential)



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

May 16, 2011

STATION ENTRANCE

KEY PEDESTRIAN LINKAGE

OPEN SPACE

STATION CAMPUS BOUNDARY

RIGHT-OF-WAY BOUNDARY

ROADWAY MODIFICATION

N

NOT TO SCALE

Figure 2-5
Bakersfield Station-North Alternative

The 19-acre site would designate 11.5 acres for the station, bus transit center, short-term parking, and kiss-and-ride. An additional 7.5 acres would house two parking structures that together would accommodate approximately 4,500 cars. The bus transit center and the smaller of the two parking structures (2.5 acres) would be located north of the HST tracks. The BNSF Railway line would run through the station at-grade, with the HST alignment running on an elevated guideway.

Bakersfield Station–South Alternative

The Bakersfield Station–South Alternative would be would be similarly located in Downtown Bakersfield, but situated on the Bakersfield South Alternative Alignment along Union and California avenues, just south of the BNSF Railway right-of-way (Figure 2-6). The two-level station building would be 51,000 square feet, with a maximum height of approximately 95 feet. The first floor would house the concourse, and the platforms and the guideway would be on the second floor. Access to the site would be from two new boulevards, one branching off from California Avenue and the other from Union Avenue.

The entire site would be 20 acres, with 15 acres designated for the station, bus transit center, short-term parking, and kiss-and-ride. An additional 5 acres would support one six-level parking structure with a capacity of approximately 4,500 cars. Unlike the Bakersfield Station–North Alternative, this station site would be located entirely south of the BNSF Railway right-of-way.

2.2.3 Heavy Maintenance Facility (HMF)

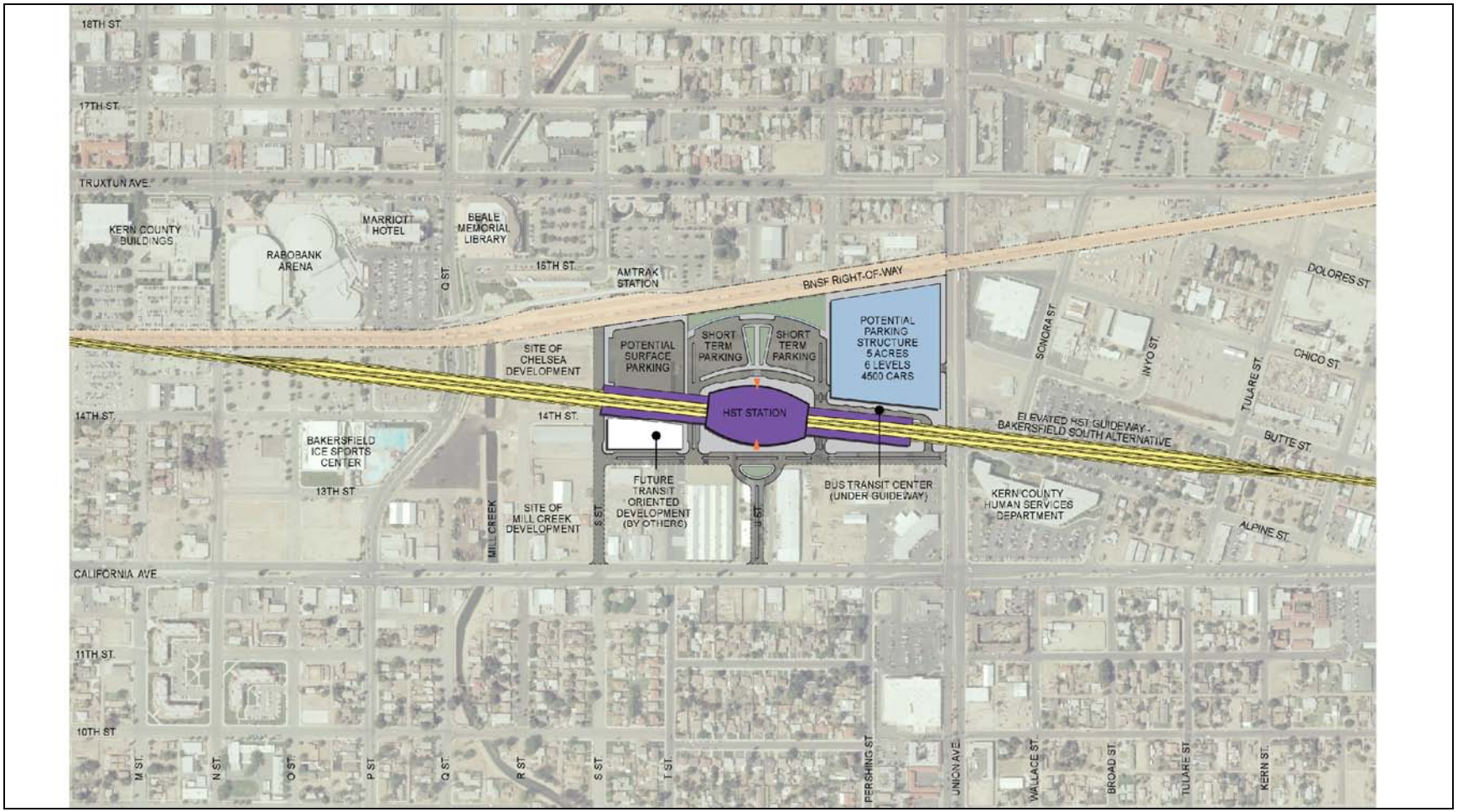
One HST heavy vehicle maintenance and layover facility would be sited along either the Merced to Fresno or Fresno to Bakersfield HST section. Before the startup of initial operations, the HMF would support the assembly, testing, commissioning, and acceptance of high-speed rolling stock. During regular operations, the HMF would provide maintenance and repair functions, activation of new rolling stock, and train storage. The HMF concept plan indicates that the site would encompass approximately 150 acres to accommodate shops, tracks, parking, administration, roadways, power substation, and storage areas. The HMF would include tracks that allow trains to enter and leave under their own electric power or under tow. The HMF would also have management, administrative, and employee support facilities. Up to 1,500 employees could work at the HMF during any 24-hour period.

The Authority has determined that one HMF would be located between Merced and Bakersfield; however, the specific location has not yet been finalized. Five HMF sites are under consideration in the Fresno to Bakersfield Section (Figure 2-1):

- The Fresno Works–Fresno HMF site lies within the southern limits of the city of Fresno and county of Fresno next to the BNSF Railway right-of-way between SR 99 and Adams Avenue. Up to 590 acres are available for the facility at this site.
- The Kings County–Hanford HMF site lies southeast of the city of Hanford, adjacent to and east of SR 43, between Houston and Idaho avenues. Up to 510 acres are available at the site.
- The Kern Council of Governments–Wasco HMF site lies directly east of Wasco between SR 46 and Filburn Street. Up to 420 acres are available for the facility at this site.

- The Kern Council of Governments–Shafter East HMF site lies in the city of Shafter between Burbank Street and 7th Standard Road to the east of the BNSF Railway right-of-way. This site has up to 490 acres available for the facility.[1]

[1] There is no discernable difference in transportation impacts between the Shafter East and the Shafter West HMF sites. Therefore, in Chapter 5, Impacts and Mitigation, these two sites are considered together as the "Shafter HMF sites."



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

May 16, 2011

STATION ENTRANCE

KEY PEDESTRIAN LINKAGE

OPEN SPACE

STATION CAMPUS BOUNDARY

RIGHT-OF-WAY BOUNDARY

ROADWAY MODIFICATION

N

NOT TO SCALE

Figure 2-6
Bakersfield Station-South Alternative

- The Kern Council of Governments–Shafter West HMF site lies in the city of Shafter between Burbank Street and 7th Standard Road to the west of the BNSF Railway right-of-way. This site has up to 480 acres available for the facility.

2.3 Power

To provide power for the HST, high-voltage electricity at 115 kV and above would be drawn from the utility grid and transformed down to 25,000 volts. The voltage would then be distributed to the trains via an overhead catenary system. The project would not include the construction of a separate power source, although it would include the extension of power lines to a series of power substations positioned along the HST corridor. The transformation and distribution of electricity would occur in three types of stations:

- Traction power supply stations (TPSSs) transform high-voltage electricity supplied by public utilities to the train operating voltage. TPSSs would be sited adjacent to existing utility transmission lines and the HST right-of-way, and would be located approximately every 30 miles along the route. Each TPSS would be 200 feet by 160 feet.

- Switching stations connect and balance the electrical load between tracks, and switch power on or off to tracks in the event of a power outage or emergency. Switching stations would be located midway between, and approximately 15 miles from, the nearest TPSS. Each switching station would be 120 feet by 80 feet and located adjacent to the HST right-of-way.

- Paralleling stations, or autotransformer stations, provide voltage stabilization and equalize current flow. Paralleling stations would be located every 5 miles between the TPSSs and the switching stations. Each paralleling station would be 100 feet by 80 feet and located adjacent to the HST right-of-way.

2.4 Project Construction

The construction plan developed by the Authority and described below would maintain eligibility for eligibility for federal American Recovery and Reinvestment Act (ARRA) funding. For the Fresno to Bakersfield Section, specific construction elements would include at-grade, below-grade, and elevated track, track work, grade crossings, and installation of a positive train control system. At-grade track sections would be built using conventional railroad construction techniques. A typical sequence includes clearing, grubbing, grading, and compacting the rail bed; applying crushed rock ballast; laying track; and installing electrical and communications systems.

The precast segmental construction method is proposed for elevated track sections. In this construction method, large concrete bridge segments would be mass-produced at an onsite temporary casting yard. Precast segments would then be transported atop the already completed portions of the elevated track and installed using a special gantry crane positioned on the aerial structure. Although the precast segmental method is the favored technique for aerial structure construction, other methods may be used, including cast-in-place, box girder, or precast span-by-span techniques.

Pre-construction activities would be conducted during final design and include geotechnical investigations, identification of staging areas, initiation of site preparation and demolition, relocation of utilities, and implementation of temporary, long-term, and permanent road closures. Additional studies and investigations to develop construction requirements and worksite traffic control plans would be conducted as needed.

Major construction activities for the Fresno to Bakersfield Section would include the construction of earthwork and excavation support systems, bridges and aerial structures, railroad systems

(including trackwork, traction electrification, signaling, and communications), and stations. During peak construction periods, work is envisioned to be underway at several locations along the route, with overlapping construction of various project elements. Working hours and workers present at any time will vary depending on the activities being performed.

The Authority intends to build the project using sustainable methods that:

- Minimize the use of nonrenewable resources.
- Minimize the impacts on the natural environment.
- Protect environmental diversity.
- Emphasize the use of renewable resources in a sustainable manner.

The overall schedule for construction is provided in Table 2-1.

Table 2-1
Construction Schedule

Activity	Tasks	Duration
Mobilization	Safety devices and special construction equipment mobilization	March–October 2013
Site Preparation	Utilities relocation; clearing/grubbing right-of-way; establishment of detours and haul routes; preparation of construction equipment yards, stockpile materials, and precast concrete segment casting yard	April–August 2013
Earthmoving	Excavation and earth support structures	August 2013–August 2015
Construction of Road Crossings	Surface street modifications, grade separations	June 2013–December 2017
Construction of Elevated Structures	Aerial structure and bridge foundations, substructures, and superstructures	June 2013–December 2017
Track Laying	Includes backfilling operations and drainage facilities	January 2014–August 2017
Systems	Train control systems, overhead contact system, communication system, signaling equipment	July 2016–November 2018
Demobilization	Includes site cleanup	August 2017–December 2019
HMF Phase 1[a]	Test track assembly and storage	August–November 2017
Maintenance-of-Way Facility	Potentially co-located with HMF[a]	January–December 2018

Table 2-1
Construction Schedule

Activity	Tasks	Duration
HMF Phase 2[a]	Test track light maintenance facility	June–December 2018
HMF Phase 3[a]	Heavy Maintenance Facility	January–July 2021
HST Stations	Demolition, site preparation, foundations, structural frame, electrical and mechanical systems, finishes	Fresno: December 2014–October 2019 Kings/Tulare Regional: TBD[b] Bakersfield: January 2015–November 2019

Notes:
[a] The HMF would be sited along either the Merced to Fresno or Fresno to Bakersfield section.
[b] ROW would be acquired for the Kings/Tulare Regional Station; however, the station itself would not be part of initial construction.
Acronym:
TBD = to be determined

Chapter 3
Regulatory Requirements

3.0 Regulatory Requirements

3.1 Methodology for Impact Analysis

3.1.1 Traffic Operational Standards

Level of service (LOS) is the primary unit of measure for stating the operating quality of a highway or roadway. LOS is calculated by comparing the actual number of vehicles using a roadway to its carrying capacity. In general, LOS is measured by the ratio of traffic volume to capacity (V/C) or by the average delay experienced by vehicles on the facility.

The *Highway Capacity Manual* (HCM) (Transportation Research Board 2000) is a recognized source for the techniques used to measure transportation facility performance. Using the HCM procedures, the quality of traffic operation is graded into one of six LOS designations: A, B, C, D, E, or F. LOS A represents the best range of operating conditions and LOS F represents the worst.

A. INTERSECTIONS

The average delay per vehicle and LOS for signalized intersections are defined quantitatively in Table 3.1-1. A capacity of 1,700 to 1,900 vehicles per lane per hour should be used depending on the standard set in local procedures. A lost time of 4 seconds per signal phase should be used. Per lane capacities and lost times may need to be adjusted to account for unusual intersection geometric conditions or traffic-signal phasing (e.g., bus priority phasing or pedestrian-only signal phasing). The Program Management Team will identify a standard to determine if the project has an impact on the intersection based on LOS and delay times.

The LOS and delay parameters for unsignalized intersections are listed in Table 3.1-2.

Table 3.1-1
Level of Service, Average Vehicular Delay, and Volume-to-Capacity Definition for Signalized Intersections

Level of Service	Delay per Vehicle (seconds)	Volume-to-Capacity Definition
A	< 10	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	> 10 and < 20	VERY GOOD. An occasional approach phase is fully used; many drivers begin to feel somewhat restricted within groups of vehicles.
C	> 20 and < 35	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	> 35 and < 55	FAIR. Delays may be substantial during portions of rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	> 55 and < 80	POOR. Represents the maximum vehicles that intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 80	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Note: Approach phase is defined as any movement in any direction.
Source: Transportation Research Board 2000.

Table 3.1-2
Level of Service and Average Vehicular Delay Definition for Unsignalized Intersections

Level of Service	Delay per Vehicle (seconds)
A	< 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

Source: Transportation Research Board 2000.
Note: Levels of Service defined in Table 3.1-1.

B. ROADWAYS

The LOS indicators for the roadway system are based on the volume of traffic for designated sections of roadway during a typical day, and the practicable vehicular capacity of that segment. These two measures for each monitored segment of the roadway system are expressed as a ratio. The V/C ratio is then converted to an alpha descriptor identifying operating conditions and expressed as a level of service from LOS A through LOS F. LOS A identifies the best-operating conditions along a section of roadway and is characterized by free-flow traffic, low volumes, and little or no restrictions on maneuverability. LOS F characterizes forced traffic flow with high-traffic densities, slow travel speeds, and often stop-and-go conditions.

The theoretical daily capacity of a roadway is determined by the number of lanes and the type of facility. The daily capacities by roadway type used in this analysis vary by agency. Table 3.1-3 defines and describes the LOS criteria for the roadway segment analysis. The segment analyses completed for this study using the criteria below included analysis of only four-lane and larger non-freeway facilities. Freeway facilities are under the jurisdiction of the California Department of Transportation (Caltrans) or the county transportation authority and are analyzed as part of the Congestion Management Program (CMP).

Table 3.1-3
Roadway Segment Level-of-Service Criteria

Level of Service	Volume-to-Capacity Ratio	Definition
A	0.00–0.60	Free-flow speeds prevail. Vehicles are almost unimpeded in their ability to maneuver within the traffic stream.
B	0.61–0.70	Reasonably free-flow speeds are maintained. The ability to maneuver within traffic is only slightly restricted.
C	0.71–0.80	Flow with speeds at or near free-flow speed of the roadway. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes

Table 3.1-3
Roadway Segment Level-of-Service Criteria

Level of Service	Volume-to-Capacity Ratio	Definition
		require more care and vigilance on the part of the driver.
D	0.81–0.90	Speeds begin to decline slightly with increasing flows. In this range, density begins to increase somewhat more quickly with increasing flow. Freedom to maneuver within the traffic stream is noticeably limited.
E	0.91–1.00	Operation at capacity with no usable gaps in the traffic stream. Any disruption to the traffic stream has little or no room to dissipate.
F	> 1.00	Breakdown in the traffic flow with long queues of traffic. Unacceptable conditions.
Source: Los Angeles County 2004. Note: Levels of Service defined in Table 3.1-1.		

3.1.2 State Regulations

Key state transportation regulations that are most relevant to the proposed project are summarized below.

- CEQA [Section 21000 et seq.] and CEQA Guidelines [Section 15000 et seq.] require state and local agencies to identify the significant environmental impacts of their actions, including potential significant impact on transportation and traffic systems, and to avoid or mitigate those impacts, when feasible.

- California Government Code Section 65080 requires each transportation planning agency to prepare and adopt a regional transportation plan (RTP) directed at achieving a coordinated and balanced regional transportation system.

- California Streets and Highways Code [Section 1 et seq.] includes the provisions and standards for administration of the statewide streets and highways system.

Designated state route and interstate highway facilities are under the jurisdiction of Caltrans, except where management of the facility has been delegated to local jurisdictions. Operations analysis of Caltrans facilities is conducted according to the methodology set forth in the *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002).

3.1.3 Regional and Local

Key regional and local regulatory frameworks that are most relevant to the proposed project are summarized below:

- Traffic Congestion Relief and Spending Limit Act

  In urbanized counties, a designated congestion management agency is responsible for implementing the Traffic Congestion Relief and Spending Limit Act to assist in the land use decisionmaking process and to address transportation and air quality impacts in the county.

- General Plan Policies

Policies outlined in general plans by city and county jurisdictions to identify future developments and establish standards.

- Transportation and Circulation Elements

  Alternative transportation plans, policies, and programs. Consider whether the project conflicts with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

3.1.4 Congestion Management Programs

The CMP addresses the impact of local growth on the regional transportation system. Statutory elements of the CMP include highway and roadway system monitoring, multimodal system performance analysis, the Transportation Demand Management (TDM) program, the Land Use Analysis program, and local conformance for all county jurisdictions.

Although many levels of government are involved in developing and implementing the CMP, local jurisdictions have significant implementation responsibilities. These include assisting in monitoring the CMP roadway and transit system, implementing a TDM ordinance, implementing a program to analyze the impacts of local land use decisions on the regional transportation system, and participating in the Countywide Deficiency Plan. Jurisdictions are required to conform to local CMP requirements to receive their portion of state gas tax revenue allocated by Section 2105 of the California Streets and Highways Code. In addition, compliance with the CMP is necessary to preserve their eligibility for state and federal funding for transportation projects.

A. COUNCIL OF FRESNO COUNTY GOVERNMENTS

The Council of Fresno County Governments (Fresno COG), formed in 1969, includes the County of Fresno and 15 incorporated cities as member agencies. Its role is to foster intergovernmental coordination, comprehensive regional planning with an emphasis on transportation, provide for citizen input in the planning process, and provide technical services to its member governments. The major function of Fresno COG is the activity generated by its responsibility as a designated transportation planning agency, in compliance with federal and state requirements. LOS D has been established as the minimum systemwide LOS traffic standard in Fresno County.

B. KINGS COUNTY CONGESTION MANAGEMENT PROGRAM

The Kings County Regional Transportation Planning Agency and Metropolitan Planning Organization covers the entire Kings County area including the incorporated cities.

C. KERN COUNTY CONGESTION MANAGEMENT PROGRAM

A total of 18 state highways and 5 principal arterials have been designated as part of the Congestion Management System of Highways and Roadways. The roads selected as principal arterials by the Congestion Management Agency serve inter-regional traffic traveling between state highways and also complete gaps in the Congestion Management Network. The CMP includes a system of highways and roadways, with minimum levels of service performance measurements designated for highway segments and key roadway segments; a performance element that includes performance measures to evaluate multimodal system performance; a TDM element that promotes alternative transportation strategies; and a land-use analysis program to analyze the impacts of local land-use decisions on the regional transportation. LOS E has been established as the minimum systemwide LOS traffic standard in the Kern County Congestion Management Plan.

The LOS thresholds and significant impact criteria are similar between the various affected agencies. The following sections describe each agency's traffic analysis standards and policies.

3.1.5 City of Fresno Plans and Policies

A. TRAFFIC IMPACT ANALYSIS STANDARDS

City of Fresno General Plan objectives (City of Fresno 2002) are to:

- Provide a complete and continuous streets and highways system throughout the Fresno metropolitan area that is safe for vehicle users, bicyclists, and pedestrians and that provides efficient movement of people and goods.
- Maintain a coordinated land use and circulation system that conforms to planned growth, minimizes traffic conflicts, reduces impact on adjacent land uses, and preserves the integrity of existing neighborhoods.
- Provide for efficient fiscal management and administration of the streets and highways service delivery system.
- Preserve and provide scenic corridors by application of appropriate policies and regulations.

According to the City of Fresno traffic study guidelines, all intersections and roadway segments will operate at a LOS D, or better, under the near-term conditions, unless a finding of overriding consideration was adopted in the Master General Plan EIR (City of Fresno 2006). Under long-term conditions, all city intersections and roadway segments will also operate at a LOS D, or better, except for the roadway segments adopted in the Master General Plan EIR to operate at LOS E or F. The LOS will be based on average delay for signalized and unsignalized intersections and Florida tables for roadway segments (State of Florida Department of Transportation 2002).

The study area intersection within the sphere of influence determination was based on various factors, as presented in the City of Fresno traffic study guidelines (City of Fresno 2006). In addition to the requirement that traffic impacts at intersections within the proposed stations' sphere of influence must be evaluated, intersections outside of the potential sphere of influence must also be analyzed if the City of Fresno staff deems that potential impacts may be experienced in the future.

B. CITY OF FRESNO SIGNIFICANT IMPACT CRITERIA

For study intersections, the impact is considered significant if the additional traffic generated from the proposed project results in any one of the following (City of Fresno 2006):

- Triggers an intersection that was operating at an acceptable LOS to operate at unacceptable levels of service.
- Triggers an intersection that was operating at an unacceptable LOS (LOS E) to operate at LOS F.
- Increases the average delay for a study intersection that is already operating at unacceptable LOS.

3.1.6 City of Hanford Plans and Policies

City of Hanford General Plan transportation and circulation objectives are to:

- Establish a circulation system that is consistent with the land-use patterns of the city.

- Provide timely and effective means of programming and constructing street and highway improvements to maintain an overall LOS C, with a peak-hour LOS D, or better, as defined in the HCM (Transportation Research Board 2000), unless the city's design considerations or other public health, safety, or welfare factors determine otherwise.
- Achieve a coordinated regional and local transportation system that minimizes traffic congestion and efficiently serves users.
- Provide adequate parking and loading facilities while encouraging alternative means of transportation.
- Promote maximum opportunities for pedestrian traffic throughout the city by continuing to develop and maintain a safe sidewalk system that facilitates pedestrian access, including disabled persons' accessibility to public transit for commuting, recreation, or other purposes.
- Develop a vehicular circulation system that is safe and sensitive to adjoining land uses.
- Contribute towards improving the air quality of the region through more-efficient use of private vehicles and increased use of alternative transportation modes.

The *City of Hanford General Plan* has established LOS C as the standard for city streets, although the General Plan permits the city to accept LOS D during the peak hour in locations where physical constraints to providing additional capacity exist (City of Hanford 2002). The City of Hanford currently does not have published traffic impact analysis guidelines; therefore, HCM methodologies will be used in traffic impact analysis. Based on HCM methodology, an intersection with LOS E or F will be considered to have significant impacts. Guidelines of delay per vehicle and V/C thresholds based on the HCM methodology are discussed in Section 3.2.1.

3.1.7 City of Bakersfield Plans and Policies

A. TRAFFIC IMPACT ANALYSIS STANDARDS

Goals of the City of Bakersfield General Plan are to:

- Provide a safe and efficient street system that links all parts of the area for movement of people and goods.
- Provide safe and efficient motorized, non-motorized, and pedestrian traffic movement.
- Minimize the impact of truck traffic on circulation and on noise-sensitive land uses.
- Provide a street system that creates a positive image of Bakersfield and contributes to residents' quality of life.
- Provide a system of freeways which maintains adequate travel times in and around the metropolitan area.
- Provide a local street network that contributes to the quality and safety of residential neighborhoods and commercial districts.
- Develop and maintain a circulation system that supports the land use plan documented in the General Plan.

In keeping with the City of Bakersfield and Kern County Guidelines, all intersections and roadway segments will operate at LOS C, or better. The LOS will be based on average delay for signalized and unsignalized intersections and on daily traffic capacity for roadway segments. The study area

intersections and roadway segments within the sphere of influence were determined in consultation with City of Bakersfield staff.

B. SIGNIFICANT IMPACT CRITERIA

The City of Bakersfield performance criterion for intersections and roadway segments is LOS C (City of Bakersfield 2010a, Circulation Element). If the existing operational LOS of a facility is worse than LOS C before the addition of the proposed project and cumulative traffic, the city's performance criterion is to restore the intersection or roadway segment to its existing operational LOS, or better.

The City of Bakersfield and County of Kern have two standards for determining whether project traffic has a significant impact and therefore requires mitigation, as follows:

- Mitigation is required when the addition of project traffic causes the LOS of an intersection or street to drop below LOS C.
- Intersections or street segments operating below LOS C before the addition of project traffic would require mitigation only as necessary to maintain the status quo.

Additionally, the City of Bakersfield requires new criteria for intersections currently or projected to operate at LOS D, E, or F. These require that projects identify mitigation necessary so that these intersections' average control delay per HCM, after the addition of project traffic, is within 5 seconds of the intersections' delay that existed before the addition of project-generated traffic.

3.1.8 Caltrans

According to Caltrans' *Guide for the Preparation of Traffic Impact Studies* dated December 2002, a traffic impact study is generally needed when a project:

- Generates over 100 peak-hour trips assigned to a state highway facility.
- Generates 50 to 100 peak-hour trips assigned to a state highway facility, and affected state highway facilities are experiencing noticeable delay approaching unstable traffic flow conditions (LOS C or D).
- Generates 1 to 49 peak-hour trips assigned to a state highway facility. The following are examples of conditions that may require a full traffic impact study, or some lesser analysis:
  - The affected state highway facilities experience significant delay; unstable or forced traffic flow conditions (LOS E or F).
  - The potential risk for a traffic incident, such as congestion-related collisions, nonstandard sight distance considerations, or an increase in traffic conflict points, is significantly increased.
  - A change in local circulation networks impact a state highway facility (i.e., direct access to a state highway facility, a nonstandard highway geometric design).

Caltrans uses the methodologies outlined in the HCM and has a target LOS threshold of C for intersections and highway facilities. The Caltrans guidelines also discuss how to determine project fair-share contributions (Caltrans 2002).

Because Bakersfield and Hanford do not have any specific guidelines for evaluating roadway segments, for the purpose of this EIR/EIS, Florida tables were used for evaluating the roadway segments for the planned HST stations in Bakersfield, Fresno, and Hanford. Numerous local

jurisdictions throughout the United States use Florida tables to evaluate roadway segments for planning purposes.

3.1.9 Evaluation Criteria

This section summarizes how impacts were evaluated with the addition of traffic from the proposed project. The methods used in the Statewide Program EIR/EIS, as well as in the Bay Area to Central Valley EIR/EIS, applied the following criteria to evaluate the magnitude of change in traffic at potential station locations:

- A substantial increase in traffic in relation to the existing traffic load and capacity as defined in the criteria in Section 3.2 (i.e., results in a substantial increase in the number of vehicle trips, the V/C, or congestion at intersections).
- A change that individually or cumulatively exceeds an LOS standard established by the county congestion management agency for designated roads and highways.

For areas around potential station locations, the program-level analysis, particularly in the Bay Area to Central Valley, used a link-level analysis of impacts, which considered changes at "station screenlines"—selected segments or links on station routes (not intersections) accessing the HST station location options. For these links, aggregated future V/C ratios were calculated to compare future traffic volumes with and without the HST with future capacity of the links. The V/C ratios and corresponding LOS were reported. Consideration was given to deterioration in the LOS and maintaining an LOS of A through D was noted as generally acceptable for traffic operations in urban areas.

3.2 Traffic Analysis Criteria

The following program-level criteria are applicable to the project analysis:

- The use of LOS in describing impacts is directly applicable to project analysis.
- Considering LOS D as generally acceptable for traffic operations and addressing deterioration in LOS are directly applicable to project-level analysis of roadway segments and intersections.
- A threshold of either individually or cumulatively exceeding the LOS standard established by the county congestion management agency for designated roads and highways is directly applicable to project-level analysis.
- The general criterion of "an increase in traffic that is substantial in relation to the existing traffic load and capacity" is applicable to the project-level analysis, as follows:

  To appropriately apply this general criterion to detailed analysis of each specific roadway system element (i.e., roadway segments, signalized intersections, and unsignalized intersections), the existing local standards and thresholds used in traffic analyses for potential station locations in 26 cities within 16 counties were examined. With that information, uniform, specific methods and criteria for traffic analysis of each roadway system element were derived at the level of detail necessary for project analysis. These include deterioration in LOS to below D, addition of 0.04 to the V/C ratio for roadway segments already operating or projected to operate at LOS E or F (i.e., urban areas where a majority of the HST stations are anticipated to be located); and increase in delay of 4 seconds at signalized intersections and of 5 seconds at unsignalized intersections.

3.2.1 Recommended Project Traffic Impact Criteria

The following are the recommended project traffic analysis criteria for signalized and unsignalized intersections, roadway segments, and Congestion Management Program (CMP) facilities. These criteria are consistent with the criteria used in the Statewide Program EIR/EIS, while also specifically addressing the potential station locations in areas that are or may be subject to TOD-related policies in the future, and further refining specific contributions to "substantial increase in traffic" to be considered in the project analysis.

A. ROADWAY SEGMENTS

For roadway segments, a substantial change in the V/C ratio between the No Project and project conditions would be:

- A reduction in LOS below LOS D.

For segments that currently operate at LOS E or F:

- An increase in the V/C ratio of 0.04 or more.

B. SIGNALIZED INTERSECTIONS

Similarly, local jurisdictions typically consider a substantial change between No Project and project conditions as a 4-second to 1-second increase in average delay (frequently on a "sliding" scale), depending on the specific LOS at an intersection. Therefore a substantial change resulting from the project would be:

- A reduction in LOS to below LOS D.

For intersections that currently operate at LOS E or F:

- An increase in average delay at an intersection by 4 seconds or more.

C. UNSIGNALIZED INTERSECTIONS

A substantial change from No Project to project conditions at an unsignalized or stop-controlled intersection would be an increase in delay for the worst approach or movement, as follows:

- A reduction in LOS to below LOS D.

For intersections that currently operate at LOS E or F:

- An increase in delay for the worst approach or movement at an intersection by 5 seconds or more.

D. CONGESTION MANAGEMENT PROGRAM (CMP) FACILITIES

An impact on CMP facilities will be analyzed and assessed for significance in accordance with county-adopted CMP criteria.

3.2.2 Stations in Areas Subject to TOD-Related Policies

For a station located in an area designated for or subject to TOD-related policies, the LOS standards or policy applicable to that area was used in the traffic analysis.

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Chapter 4
Affected Environment

4.0 Affected Environment

4.1 Overall Study Area

The study area for this analysis is divided into the three key sub-areas where impacts related to the project are expected to occur. The three key study sub-area locations are:

- Fresno Station area
- Kings/Tulare Regional Station area
- Bakersfield Station area

The following sections discuss and analyze the existing conditions for the proposed three stations, including:

- Current site conditions, highways, and roads in the site vicinity
- Existing roadway and intersection traffic volumes
- Roadway and intersection operating conditions
- Planned and programmed improvements
- Transit facilities and services
- Regional airports
- Non-motorized facilities
- Area freight and goods movement

As part of the project, existing at-grade crossings in the corridor may be grade-separated or closed, diverting traffic to nearby streets. These crossings will be evaluated in the EIR phase of this project.

4.2 Fresno Station Area

The area surrounding the proposed Fresno HST station is highly developed with a variety of lane uses and very little vacant land. Within a 0.5-mile (0.8 kilometer) radius of the station, development consists almost entirely of commercial and industrial land uses, beyond which lie residential neighborhoods. The area is essentially bifurcated by State Route (SR) 41, SR 99, and SR 180. The city's downtown is east of the proposed station. The study area is served regionally by SR 41, SR 99, and SR 180 and locally by a connecting grid pattern of expressways, arterials, collector roads, and local roads.

4.2.1 Fresno Station Study Area

The study area for the proposed HST station in the city of Fresno was developed through discussions with staff from the City of Fresno. After the discussions, 104 study intersections and 41 roadway segments were chosen for analysis in this report. The study intersections are illustrated on Figures 4.2-1a and 4.2-1b.[2]

A. STUDY INTERSECTIONS

The following list identifies the study intersections for this project:

[2] [2] Note: Because of the large number of figures in this technical report, all figures cited from this point forward are provided in a "Figures" section at the end of the text (and before the appendices).

- Broadway Street/SR 41 northbound ramp/Monterey Street
- Van Ness Avenue/SR 41 northbound ramp
- Broadway Street/SR 41 southbound ramp
- Van Ness Avenue/SR 41 southbound ramp
- SR 99 southbound ramps/Ventura Avenue
- SR 99 northbound ramps/Ventura Avenue
- E Street/Ventura Avenue
- G Street/Ventura Avenue
- Broadway Street/Ventura Avenue
- Van Ness Avenue/Ventura Street
- M Street/Ventura Avenue
- O Street/Ventura Avenue
- P Street/Ventura Avenue
- N. 1st Street/Ventura Avenue
- G Street/Inyo Street
- H Street/Inyo Street
- Van Ness Avenue/Inyo Street
- M Street/Inyo Street
- P Street/Inyo Street
- G Street/Kern Street
- H Street/Kern Street
- E Street/Tulare Street
- F Street/Tulare Street
- G Street/Tulare Street
- H Street/Tulare Street
- Van Ness Avenue/Tulare Street
- M Street/Tulare Street
- P Street/Tulare Street
- R Street/Tulare Street
- U Street/Tulare Street
- Divisadero Street off-ramp/Tulare Street
- SR 41 southbound ramp/Divisadero Street
- SR 41 northbound ramps/Tulare Street
- N. First Street/Tulare Street
- H Street/Mariposa Street/Fresno ramps
- C Street/Fresno Street
- SR 99 southbound ramps/Fresno Street
- SR 99 northbound ramps/Fresno Street
- G Street/Fresno Street
- H Street/Fresno Street
- Broadway Street/Fresno Street
- Van Ness Avenue/Fresno Street
- M Street/Fresno Street
- P Street/Fresno Street
- Fresno Street/R Street
- Fresno Street/Divisadero Street
- H Street/Broadway Street
- E Street/Tuolumne Street
- Broadway Street/Tuolumne Street
- Van Ness Avenue/Tuolumne Street
- Street/Tuolumne Street
- E Street/Stanislaus Street
- Broadway Street/Stanislaus Street

- Van Ness Avenue/Stanislaus Street
- N. Blackstone Avenue/Stanislaus Street
- N. Abby Street/E. Divisadero Street
- N. Blackstone Avenue/Divisadero Street
- H Street/San Joaquin Street
- M Street/Divisadero Street
- H Street/Amador Street
- G Street/Divisadero Street
- N. Roosevelt Avenue/E. Divisadero Avenue
- H Street/Divisadero Street
- Broadway Street/Divisadero Street
- Fulton Street/Divisadero Street
- Van Ness Avenue/Divisadero Street
- H Street/Roosevelt Street
- N. Blackstone Avenue/E. McKenzie Avenue
- N. Abby Street/E. McKenzie Avenue
- Fulton Street/SR 180 eastbound ramps
- Van Ness Avenue/SR 180 eastbound ramps
- Fulton Street/SR 180 westbound ramps
- Van Ness Avenue/SR 180 westbound ramps
- N. Blackstone Avenue/E. Belmont Avenue
- N. Abby Street/E. Belmont Street
- Fresno Street/E. Belmont Street
- N. First Street/E. Belmont Street
- N. Blackstone Avenue/SR 180 eastbound ramps
- N. Abby Street/SR 180 eastbound ramps
- N. Blackstone Avenue/SR 180 westbound ramps
- Broadway Street/Amador Street
- Broadway Street/San Joaquin Street
- F Street/Fresno Street
- G Street/Mono Street
- H Street/Mono Street
- H Street/Ventura Street
- O Street/Santa Clara Street/SR 41 southbound off-ramp
- M Street/SR 41 southbound on-ramp
- M Street/San Benito Street/SR 41 northbound on-ramp
- Broadway Street/Santa Clara Street
- Van Ness Avenue/E. Hamilton Avenue
- S. Van Ness Avenue/E. California Avenue
- S. Railroad Avenue/E. Lorena Avenue
- S. Van Ness Avenue/S. Railroad Avenue
- S. Railroad Avenue/E. Florence Avenue
- S. Golden State Boulevard/E. Church Avenue
- S. Railroad Avenue/E. Church Avenue
- S. East Avenue/E. Church Avenue
- S. Sunland Avenue/E. Church Avenue
- S. East Avenue/S. Railroad Avenue
- S. East Avenue/S. Golden State Boulevard
- S. Golden State Boulevard/E. Jensen Avenue
- S. Railroad Avenue/S. Orange Avenue
- S. Golden State Boulevard/S. Orange Avenue

B. ROADWAY SEGMENTS

The roadway segments are listed as follows:

- Fulton Street, between SR 180 eastbound ramps and E. Divisadero Street
- Van Ness Avenue, between SR 180 eastbound ramps and E. Divisadero Street
- E. Divisadero Street, between H Street and Broadway Street
- H Street, between E. Divisadero Street and Stanislaus Street
- Broadway Street, between San Joaquin Street and Stanislaus Street
- Van Ness Avenue, between Stanislaus Street and E. Divisadero Street
- Stanislaus Street, between Van Ness Avenue and O Street
- N. Blackstone Avenue, between McKenzie Avenue and E. Belmont Avenue
- N. Abby Street, between McKenzie Avenue and E. Belmont Avenue
- E. Belmont Avenue, between N. Fresno Street and N. Abby Street
- Stanislaus Street, between Broadway Street and E Street
- Tuolumne Street, between Broadway Street and E Street
- Tuolumne Street, between Van Ness Avenue and O Street
- Fresno Street, between P Street and M Street
- Fresno Street, between M Street and Van Ness Avenue
- Fresno Street, between Van Ness Avenue and Broadway Street
- Fresno Street, between G Street and SR 99 Northbound ramps
- Fresno Street, between C Street and B Street
- Van Ness Avenue, between Fresno Street and Tulare Street
- Tulare Street, between Broadway Street and Van Ness Avenue
- Tulare Street, between R Street and U Street
- Divisadero Street, between N. Fresno Street and SR 41 ramps
- Tulare Street, between SR 41 ramps and N. First Street
- M Street, between Tulare Street and Inyo Street
- Inyo Street, between Broadway Street and Van Ness Avenue
- Van Ness Avenue, between Inyo Street and Ventura Avenue
- P Street, between Inyo Street and Ventura Avenue
- Ventura Avenue, between B Street and C Street
- Ventura Avenue, between E Street and G Street
- Broadway Street, between Ventura Avenue and SR 41 ramps
- Van Ness Avenue, between Ventura Avenue and SR 41 ramps
- Ventura Avenue, between M Street and Van Ness Avenue
- Ventura Avenue, between P Street and N. First Street
- N. Blackstone Avenue, between SR 180 eastbound ramps and E. Belmont Avenue
- N. Abby Street, between SR 180 eastbound ramps and E. Belmont Avenue
- Divisadero Street, between G Street and H Street
- Kern Street, between G Street and H Street
- Mono Street, between G Street and H Street
- S. Railroad Avenue, between E. Florence Avenue and E. Church Avenue
- S. Railroad Avenue, between E. Church Avenue and E. Jensen Avenue
- S. Orange Avenue, between S. Railroad Avenue and S. Golden State Boulevard

4.2.2 Highways and Roads

The area surrounding the proposed Fresno HST station has a street network consisting of expressways, superarterials, arterials, collectors, and local streets generally laid out in a grid pattern. In addition to the arterial system, three freeways pass through the study area.

SR 41 is a state highway in California, connecting the Cabrillo Highway (SR 1) in Morro Bay with Fresno and Yosemite National Park via the San Joaquin Valley. Except between U.S. 101 in

Atascadero and SR 46 near Shandon, SR 41 is part of the California Freeway and Expressway System. It was constructed as an expressway near SR 198 in Lemoore north to the southern part of Fresno, where the Yosemite Freeway begins, passing along the eastern side of downtown and extending north into Madera County.

SR 99, commonly known as Highway 99 or 99, is a north–south state highway in California, stretching almost the entire length of the Central Valley. From its south end at Interstate- (I-) 5 near Wheeler Ridge to its northern end at SR 36 near Red Bluff, SR 99 is a busy alternative to I-5 through the more-populated eastern portions of the valley. Cities passed through or near SR 99 include Bakersfield, Visalia, Fresno, Madera, Merced, Modesto, Stockton, Sacramento, Yuba City, and Chico. Almost all of SR 99 south of Sacramento is a freeway, and there are current plans to complete portions to interstate highway standards (the portions that do not meet interstate highway standards), as a parallel route to I-5 for Los Angeles to Sacramento traffic. This route is part of the California Freeway and Expressway System.

SR 180 has its western terminus at SR 33 in Mendota. In Fresno, SR 180 is the Sequoia-Kings Canyon Freeway, named for its destinations to the east in the Sierra Nevada — Sequoia National Park and Kings Canyon National Park. It has full interchanges with three other freeways: SR 99, SR 41, and SR 168. The SR 180 freeway presently runs from Brawley Avenue west of SR 99 to Temperance Avenue east of SR 168; those local streets are temporarily designated SR 180 south to the old surface alignment. The majority of SR 180, from SR 25 to the Grant Grove section of Kings Canyon National Park, is part of the California Freeway and Expressway System, but only the piece in Fresno has actually been constructed to freeway standards.

The classification of the roadways in accordance with the Fresno General Plan is:

- Freeway: Multiple-lane divided roadway servicing through- and cross-town traffic, with no access to abutting property and no at-grade intersections.
- Expressway: Four- to six-lane divided roadway primarily servicing through- and cross-town traffic, with no direct access to abutting property and with at-grade intersections at approximately 0.5-mile (0.8 kilometer) intervals.
- Superarterial: Four- to six-lane divided roadway with a primary purpose of moving traffic to and from major traffic generators and between community plan areas. The City of Fresno may approve a select number of access points to adjacent properties or local streets between the major street intersections.
- Arterial: Four- to six-lane divided roadway with somewhat limited access to abutting properties, and with the primary purpose of moving traffic within and between community plan areas and to and from freeways and expressways. In addition to major street intersections, appropriately designed and spaced local street intersections may allow left-turn movements to and from the arterial streets, subject to approval by the City of Fresno.
- Collector: Two- to four-lane undivided roadway, with the primary function of connecting local streets and arterials and neighborhood traffic generators and providing access to abutting properties.
- Local: Two- to three-lane public or private roadway designed to provide direct access to properties while discouraging through-traffic between major streets.

Figures 4.2-2a and 4.2-2b illustrate study roadway segments and provide the average daily traffic (ADT), speed, and number of lanes within approximately 1 mile (1.6 kilometers) of the proposed HST station in Fresno.

4.2.3 Existing Arterial Traffic Volumes and Levels of Service

An analysis of daily operating conditions of existing roadway segments was conducted based on the Florida tables. In all, 41 roadway segments were identified for analysis. The purpose of conducting the roadway segment analysis is to determine the current adequacy of the roadways, and to provide a baseline for future comparison of the roadway segments. The determination of which study roadway segments to analyze was based on which major roadways will be used for ingress and egress to the Fresno HST station. URS Corporation (URS) collected the ADT volumes at the study roadway segments during November 2009 and March 2011, and evaluated the capacities based on the roadway capacities identified in the Florida tables. The ADT volumes are provided in Appendix A (Traffic Counts Data). Roadway segment analysis results are summarized in Table 4.2-1. As illustrated in Table 4.2-1, all roadway segments operate at LOS D, or better, except the roadway segment of Tulare Street between SR 41 ramps and N. First Street.

4.2.4 Existing Intersection Traffic Volumes and Levels of Service

URS personnel collected peak-hour (AM and PM) turning-movement volumes at the study intersections during November 2009 and March 2011. Peak-hour turning-movement volumes at the study intersections were collected during the peak hours from 7 to 9 a.m. and from 4 to 6 p.m. Because collecting the AM and PM peak-hour volumes captures the general commute times of potential high-speed train users, establishing the peak-hour volumes will not require an evaluation of other critical peak-hour periods.

The existing lane geometries and traffic control are illustrated on Figures 4.2-3a through 4.2-3f. The existing peak-hour turning-movement volumes at the study intersections are illustrated on Figures 4.2-4a through 4.2-4f. The existing peak-hour turning-movement volumes are provided in Appendix A (Traffic Counts Data).

The LOS analysis was conducted based on the methodology documented in the earlier section using Synchro Software. Detailed calculations for the LOS analysis are provided in Appendix B (Existing Synchro Output). Table 4.2-2 summarizes the result of the LOS analysis.

As illustrated in Table 4.2-2, all intersections under existing conditions operate at an acceptable LOS, except the following intersections:

- SR 99 northbound ramps/Ventura Avenue
- E Street/Ventura Avenue
- Divisadero Street/SR 41 northbound ramps/Tulare Street
- H Street/Divisadero Street
- N. Blackstone Avenue/SR 180 westbound ramps
- M Street/San Benito Street/SR 41 northbound on-ramp

Figures 4.2-5a and 4.2-5b illustrate the LOS at the study intersections under existing conditions. The intersections of SR 99 northbound ramps/Ventura Avenue, H Street/Divisadero Street and N. Blackstone Avenue/SR 180 westbound ramps under existing conditions operate at unacceptable levels during the AM peak hour. The intersections of E Street/Ventura Avenue and M Street/San Benito Street/SR 41 northbound on-ramp operate at unacceptable levels during the PM peak hour. The intersection of Divisadero Street/SR 41 northbound ramps/Tulare Street operates at unacceptable levels during both peak hours.

Table 4.2-1
Roadway Segments Existing Daily Traffic Volumes and Level of Service: Fresno Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	LOS
1	Fulton St., between SR 180 Eastbound Ramps and E. Divisadero St.	6,970	0/2	One-Way	D
2	Van Ness Ave., between SR 180 Eastbound Ramps and E. Divisadero St.	5,204	2/0	One-Way	C
3	E. Divisadero St., between H St. and Broadway St.	9,014	2/2	Undivided	C
4	H St., between E. Divisadero St. and Stanislaus St.	4,120	1/1	Undivided	C
5	Broadway St., between San Joaquin St. and Stanislaus St.	1,916	1/2	Undivided	C
6	Van Ness Ave., between Stanislaus St. and E. Divisadero St.	5,262	1/1	Undivided/ Divided	D/C
7	Stanislaus St., between Van Ness Ave. and O St.	4,360	0/3	One-Way	C
8	N. Blackstone Ave., between McKenzie Ave. and E. Belmont Ave.	8,074	0/3	One-Way	C
9	N. Abby St., between McKenzie Ave. and E. Belmont Ave.	9,036	3/0	One-Way	C
10	E. Belmont Ave., between N. Fresno St. and N. Abby St.	12,080	2/2	Divided	C
11	Stanislaus St., between Broadway St. and E St.	6,996	0/2 before F St and 0/3 after F St	One-Way	D/C
12	Tuolumne St., between Broadway St. and E St.	5,586	2/0 before F St and 3/0 after F St	One-Way	C
13	Tuolumne St., between Van Ness Ave. and O St.	4,300	3/0	One-Way	C
14	Fresno St., between P St. and M St.	12,322	2/2	Divided	D
15	Fresno St., between M St. and Van Ness Ave.	12,150	2/2	Divided	C
16	Fresno St., between Van Ness Ave. and Broadway St.	13,250	2/2	Divided	D
17	Fresno St., between G St. and SR 99 Northbound Ramps	16,082	2/2	Divided	D
18	Fresno St., between C St. and B St.	11,860	2/2	Divided	C
19	Van Ness Ave., between Fresno St. and Tulare St.	9,992	2/1	Undivided	D
20	Tulare St., between Broadway St. and Van Ness Ave.	7,174	2/2	Divided	C
21	Tulare St., between R St. and U St.	19,910	2/2	Undivided	D
22	Divisadero St., between N. Fresno St. and SR 41 Ramps	20,338	2/2	Divided/Undivided	D
23	Tulare St., between SR 41 Ramps and N. 1st St.	32,476	2/2	Divided/Undivided	F

Table 4.2-1
Roadway Segments Existing Daily Traffic Volumes and Level of Service: Fresno Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided / Undivided	LOS
24	M St., between Tulare St. and Inyo St.	4,000	0/3	One-Way	C
25	Inyo St., between Broadway St. and Van Ness Ave.	3,302	1/1	Undivided	C
26	Van Ness Ave., between Inyo St. and Ventura Ave.	7,586	1/1	Undivided	D
27	P St., between Inyo St. and Ventura Ave.	2,018	2/0	One-Way	C
28	Ventura Ave., between B St. and C St.	13,886	2/2	Divided	D
29	Ventura Ave., between E St. and G St.	14,320	2/2	Undivided	D
30	Broadway St., between Ventura Ave. and SR 41 Ramps	3,438	1/2 before Santa Clara St 1/3 after Santa Clara St	Undivided	C
31	Van Ness Ave., between Ventura Ave. and SR 41 Ramps	9,346	1/1	Undivided	D
32	Ventura Ave., between M St. and Van Ness Ave.	11,838	2/2	Divided	C
33	Ventura Ave., between P St. and N. 1st St.	11,500	2/2	Undivided	D
34	N. Blackstone Ave., between SR 180 Eastbound Ramps and E. Belmont Ave.	12,774	0/3	One-Way	D
35	N. Abby St., between SR 180 Eastbound Ramps and E. Belmont Ave.	12,906	3/0	One-Way	D
36	Divisadero St., between G St. and H St.	7,231	2/1	Undivided	C
37	Kern St., between G St. and H St.	1,416	1/1	Undivided	C
38	Mono St., between G St. and H St.	510	1/1	Undivided	C
39	S. Railroad Ave., between E. Florence Ave. and E. Church Ave.	2,931	1/1	Undivided	C
40	S. Railroad Ave., between E. Church Ave. and E. Jensen Ave.	2,094	1/1	Undivided	C
41	S. Orange Ave., between S. Railroad Ave. and Golden State Blvd.	956	1/1	Undivided	C

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002). Levels of Service defined in Table 3.1-1.

ADT	average daily traffic
E.	east
LOS	level of service
N.	north
NE	northeast
SR	State Route
SW	southwest

Table 4.2-1
Roadway Segments Existing Daily Traffic Volumes and Level of Service: Fresno Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	LOS

Table 4.2-2
Existing Peak-Hour Intersection Level of Service: Fresno Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay (s)	LOS	Delay (s)	LOS
1	Broadway St./SR 41 Northbound Ramp/Monterey St.	Two-Way Stop	8.9	A	10.3	B
2	Van Ness Ave./SR 41 Northbound Ramp	All-Way Stop	10.2	B	10.1	B
3	Broadway St./SR 41 Southbound Ramp	One-Way Stop	9.3	A	10.8	B
4	Van Ness Ave./SR 41 Southbound Ramp	One-Way Stop	24.5	C	13.3	B
5	SR 99 Southbound Ramps/Ventura Ave.	Signalized	10.5	B	7.2	A
6	SR 99 Northbound Ramps/Ventura Ave.	One-Way Stop	137.2	F	34.5	D
7	E St./Ventura Ave.	Two-Way Stop	32.1	D	35.7	E
8	G St./Ventura Ave.	Signalized	9.6	A	10.5	B
9	Broadway St./Ventura Ave.	Signalized	14.7	B	20.7	C
10	Van Ness Ave./Ventura St.	Signalized	18.6	B	16.2	B
11	M St./Ventura Ave.	Signalized	9.2	A	10.4	B
12	O St./Ventura Ave.	Signalized	27.3	C	21.6	C
13	P St./Ventura Ave.	Signalized	6.1	A	4.9	A
14	N. 1st St./Ventura Ave.	Signalized	13.6	B	16.5	B
15	G St./Inyo St.	One-Way Stop	9.9	A	10.0	B
16	H St./Inyo St.	Signalized	9.6	A	7.8	A
17	Van Ness Ave./Inyo St.	Signalized	7.1	A	8.1	A
18	M St./Inyo St.	Signalized	6.5	A	8.2	A
19	P St./Inyo St.	Two-Way Stop	10.7	B	11.1	B
20	G St./Kern St.	Signalized	4.6	A	5.1	A
21	H St./Kern St.	One-Way Stop	13.2	B	11.6	B
22	E St./Tulare St.	Signalized	7.5	A	7.7	A
23	F St./Tulare St.	Signalized	5.7	A	7.5	A
24	G St./Tulare St.	Signalized	7.9	A	11.4	B
25	H St./Tulare St.	Signalized	11.1	B	10.5	B

Table 4.2-2
Existing Peak-Hour Intersection Level of Service: Fresno Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay (s)	LOS	Delay (s)	LOS
26	Van Ness Ave./Tulare St.	Signalized	20.4	C	18.5	B
27	M St./Tulare St.	Signalized	9.8	A	10.5	B
28	P St./Tulare St.	Signalized	6.4	A	6.2	A
29	R St./Tulare St.	Signalized	12.0	B	11.8	B
30	U St./Tulare St.	Signalized	6.1	A	13.3	B
31	Divisadero St. Off-Ramp/Tulare St.	Signalized	7.1	A	11.7	B
32	SR 41 Southbound Ramp/Divisadero St.	Signalized	20.3	C	9.8	A
33	SR 41 Northbound Ramps/Tulare St.	Signalized	10.0	B	12.3	B
33-0	Divisadero St./SR 41 Northbound Ramps/Tulare St.	Signalized	140.9	F	375.5	F
34	N. 1st St./Tulare St.	Signalized	34.0	C	35.9	D
35	H St./Mariposa St./Fresno Ramps	Signalized	9.4	A	8.3	A
36	C St./Fresno St.	Signalized	8.1	A	13.4	B
37	SR 99 Southbound Ramps/Fresno St.	Signalized	18.2	B	23.7	C
38	SR 99 Northbound Ramps/Fresno St.	Signalized	16.2	B	22.5	C
39	G St./Fresno St.	Signalized	7.2	A	7.0	A
40	H St./Fresno St.	Not Used				
41	Broadway St./Fresno St.	Signalized	5.0	A	6.9	A
42	Van Ness Ave./Fresno St.	Signalized	23.6	C	25.4	C
43	M St./Fresno St.	Signalized	9.6	A	9.4	A
44	P St./Fresno St.	Signalized	9.6	A	9.8	A
45	Fresno St./R St.	Signalized	11.1	B	11.8	B
46	Fresno St./Divisadero St.	Signalized	22.7	C	23.1	C
47	H St./Broadway St.	Signalized	6.7	A	8.9	A
48	E St./Tuolumne St.	Signalized	8.9	A	10.2	B
49	Broadway St./Tuolumne St.	Signalized	10.1	B	11.0	B
50	Van Ness Ave./Tuolumne St.	Signalized	11.2	B	12.7	B
51	O St./Tuolumne St.	Signalized	4.1	A	4.3	A
52	E St./Stanislaus St.	Signalized	6.2	A	8.5	A
53	Broadway St./Stanislaus St.	Signalized	9.3	A	8.6	A
54	Van Ness Ave./Stanislaus St.	Signalized	10.5	B	11.9	B
55	N. Blackstone Ave./Stanislaus St.	Signalized	19.9	B	15.3	B
56	N. Abby St./E. Divisadero St.	Signalized	10.9	B	13.5	B

Table 4.2-2
Existing Peak-Hour Intersection Level of Service: Fresno Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay (s)	LOS	Delay (s)	LOS
57	N. Blackstone Ave./Divisadero St.	Signalized	13.8	B	10.5	B
58	H St./San Joaquin St.	One-Way Stop	12.8	B	12.4	B
59	M St./Divisadero St.	Signalized	7.6	A	6.4	A
60	H St./Amador St.	One-Way Stop	14.6	B	12.3	B
61	G St./Divisadero St.	Signalized	8.1	A	8.7	A
62	N. Roosevelt Ave./E. Divisadero Ave.	One-Way Stop	13.8	B	16.5	C
63	H St./Divisadero St.	Signalized	74.7	E	33.7	C
64	Broadway St./Divisadero St.	Signalized	5.7	A	7.7	A
65	Fulton St./Divisadero St.	Signalized	11.9	B	10.6	B
66	Van Ness Ave./Divisadero St.	Signalized	8.7	A	13.2	B
67	H St./Roosevelt St.	Signalized	13.9	B	13.5	B
68	N. Blackstone Ave./E. McKenzie Ave.	Signalized	5.7	A	6.8	A
69	N. Abby St./E. McKenzie Ave.	Signalized	6.8	A	7.5	A
70	Fulton St./SR 180 Eastbound Ramps	Signalized	11.3	B	8.7	A
71	Van Ness Ave./SR 180 Eastbound Ramps	Signalized	7.4	A	10.8	B
72	Fulton St./SR 180 Westbound Ramps	Signalized	18.0	B	9.8	A
73	Van Ness Ave./SR 180 Westbound Ramps	Signalized	8.7	A	10.6	B
74	N. Blackstone Ave./E Belmont Ave.	Signalized	17.5	B	15.0	B
75	N. Abby St./E. Belmont St	Signalized	13.5	B	16.4	B
76	Fresno St./E. Belmont St.	Signalized	23.9	C	29.9	C
77	N. 1st St./E. Belmont St.	Signalized	22.0	C	27.1	C
78	N. Blackstone Ave./SR 180 Eastbound Ramps	Signalized	8.5	A	5.9	A
79	N. Abby St./SR 180 Eastbound Ramps	Signalized	9.0	A	11.0	B
80	N. Blackstone Ave./SR 180 Westbound Ramps	Signalized	171.1	F	17.4	B
81	Broadway St./Amador St.	Two-Way Stop	10.2	B	10.9	B
82	Broadway St./San Joaquin St.	Two-Way Stop	9.8	A	11.0	B
83	F St./Fresno St.	Signalized	4.8	A	5.2	A
84	G St./Mono St.	Two-Way Stop	10.2	B	11.0	B
85	H St./Mono St.	Two-Way Stop	11.0	B	11.9	B
86	H St./Ventura St.	Two-Way Stop	34.7	D	28.6	D
87	O St./Santa Clara St./SR 41 SB Off-Ramp	Four-Way Stop	11.5	B	11.1	B
88	M St./SR 41 SB On-Ramp	Not Used				
89	M St./San Benito St./SR 41 NB On-Ramp	Two-Way Stop	11.7	B	218.0	F

Table 4.2-2
Existing Peak-Hour Intersection Level of Service: Fresno Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay (s)	LOS	Delay (s)	LOS
90	Broadway St./Santa Clara St	Two-Way Stop	14.2	B	10.4	B
91	Van Ness Ave./E. Hamilton Ave.	All Way Stop	9	A	8.7	A
92	S. Van Ness Ave./E. California Ave.	Two-Way Stop	10.8	B	11.6	B
93	S. Railroad Ave./E. Lorena Ave.	One-Way Stop	0.3	A	9.6	A
94	S. Van Ness Ave./S. Railroad Ave.	One-Way Stop	10.7	B	11	B
95	S. Railroad Ave./E. Florence Ave.	Two-Way Stop	11	B	11.5	B
96	Golden State Blvd./E. Church Ave.	Signalized	14.1	B	13.3	B
97	S. Railroad Ave./E. Church Ave.	Signalized	5.4	A	5.8	A
98	S. East Ave./E. Church Ave.	One-Way Stop	11.4	B	12.8	B
99	S. Sunland Ave./E. Church Ave.	Two-Way Stop	14.4	B	16.3	C
100	S. East Ave./S. Railroad Ave.	One-Way Stop	10.7	B	11.1	B
101	S. East Ave./Golden State Blvd.	Signalized	17.2	B	24.9	C
102	Golden State Blvd./E. Jensen Ave.	Signalized	14.9	B	14.8	B
103	S. Railroad Ave./S. Orange Ave.	One-Way Stop	9.1	A	7.3	A
104	S. Golden State Blvd./S. Orange Ave.	Two-Way Stop	11.7	B	13.8	B

Note: Delay represented is average delay at signalized intersections and average delay on controlled approaches at unsignalized intersections. Delay is in seconds per vehicle. Levels of Service defined in Table 3.1-1.

Acronyms:

ADT	average daily traffic
AM	morning
CA	California
E.	east
LOS	level of service
N.	north
PM	afternoon
SR	State Route

4.2.5 Planned General Plan Improvements

The following are the planned improvements in the study area documented in the 2007 Fresno County Regional Transportation Plan (Fresno COG 2007):

- Central Avenue between S. Golden State Boulevard and Clovis Avenue. Widen from two lanes to four lanes.
- Central Avenue between Maple Avenue and S. Golden State Boulevard. Widen from two lanes to four lanes.
- H Street between Belmont Avenue and Ventura Street. Widen from two lanes to four lanes.
- P Street between Ventura Street and Divisadero Street. Convert to a two-way street.

- Divisadero Street at SR 41 on/off-ramps. Add southbound off-lane and dual lefts on Divisadero Street at northbound on-ramp.
- Divisadero Street between Mariposa Street and SR 41. Add new traffic signal at Mariposa Street and eliminate pedestrian crossing at the SR 41 off-ramp.
- O Street between SR 41 and Ventura Street. Improve intersection at Ventura Street and SR 41 off-ramp with northbound dual lefts at Ventura Street.

In addition to the above improvements, the following were identified from the upcoming projects list provided by City of Fresno Public Works Department:

- SR 41 off-ramp at O Street. Traffic signal and widening.
- Ventura Street, SR 99 to Broadway Street. Addition of medians on Ventura Street.

4.2.6 Transit, Taxis, and Shuttles

The proposed Fresno station study area is served by Amtrak rail service, as well as by bus service offered by Greyhound Bus Lines, Fresno County Rural Transit Agency, Fresno County Economic Opportunities Commission, and numerous private taxi services. Existing public transportation services around the proposed Fresno station are summarized in the following paragraphs.

A. FRESNO AREA EXPRESS

Fresno Area Express is the City of Fresno's transit line. Service includes 20 fixed-route bus lines and Handy Ride Paratransit Service (City of Fresno 2007). Serving the greater Fresno Metropolitan Area with a fleet of more than 100 buses, Fresno Area Express is operated by the City of Fresno as a public service to all the citizens and visitors of Fresno. The existing routes that serve the proposed HST station are summarized in the matrix below:

Bus Routes: Fresno	Frequency (min) on Weekdays
Route 20: N. Hughes/N. Marks/E. Olive	30
Route 22: N. West Ave./E. Tulare Ave	30
Route 26: N. Palm/Peach Ave	30
Route 28: CSUF/Manchester Center/W. Fresno	15
Route 30: Pinedale/N. Blackstone/W. Fresno	15
Route 32: N. Fresno/Manchester Center/W. Fresno	30
Route 33: Olive/Belmont Crosstown	30
Route 34: Northeast Fresno/N. 1st/W. Fresno	15
Route 35: Olive Crosstown	30
Route 38: N. Cedar/Jensen/Hinton Center	15
Route 39: Clinton Ave. Crosstown	30
Route 41: N. Marks Ave./Shields Ave./VMC	30
Route 45: Ashlan Crosstown	60

Figure 4.2-6 illustrates the transit routes serving the proposed Fresno HST station.

B. AMTRAK

Amtrak's San Joaquin route runs several times a day between the San Francisco Bay Area or Sacramento and Bakersfield, with services connecting to southern California. Other stops include Stockton, Modesto, Merced, Martinez, and Fresno. It is possible to use the San Joaquin line to connect to other destinations. The Bakersfield station provides connections to Santa Barbara, Los Angeles, Las Vegas, and Palm Springs. Under existing conditions, six daily round trips are provided from Oakland or Sacramento to Bakersfield (National Railroad Passenger Corporation 2010).

4.2.7 Airports

Fresno Yosemite International Airport (FYI): FYI is north of Downtown Fresno. It occupies approximately 87 acres (0.35 square kilometer) of land; the Air Cargo Park features two aircraft ramps, together with more than 500,000 square feet (46.5 square meters) of air cargo building space. The FYI has flights connecting to the San Francisco Bay Area, Los Angeles, Portland, Seattle, Mexico, and beyond. There are eight airlines that fly out of FYI and two cargo lines: Federal Express and UPS.

Fresno Chandler Downtown Airport (FCH): FCH is owned and operated by the City of Fresno and occupies an area of 200 acres (0.81 square kilometer) approximately 1 mile (1.6 kilometers) west of Downtown Fresno. Because of increased commercial and corporate activities at the FYI, FCH is designated as a reliever airport and is presently configured to provide a base for approximately 200 aircraft.

4.2.8 Nonmotorized Transportation

A. RECREATIONAL TRAILS

There are several recreational trails in the city of Fresno:

- Lewis S. Eaton Trail: The trail is currently 4 miles (6.5 kilometers) long and provides convenient access, including wheelchair access, to nature observation, as well as walking, running, cycling, and horseback riding along the San Joaquin River.
- Sugar Pine Trail: The trail is paved and includes over 4,400 trees planted by 3,000 volunteers. The trail offers a mixture of deciduous and evergreen trees so there will always be a scenic view for the many joggers, bikers, and hikers.
- Camp Pashayan Nature Trail: This trail lies along the banks of the river and makes a full loop of the park and adjacent ecological reserve.
- Jensen Loop Trail: The trail ventures off the Lewis S. Eaton Trail onto the newly acquired Jensen River Ranch and down to the banks of the river.
- Blossom Trail: The 62-mile (100-kilometer) self-guided motor or bicycle tour through California's heartland was created by the Fresno Chamber Blossom Trail Committee to celebrate and feature the natural beauty of Fresno County's agriculture and historical points of interest. The peak period for visiting the Blossom Trail is late February through March. Beyond March, visitors can still view the many beautiful wildflowers that bloom into June.

B. BIKEWAYS

The City of Fresno began its Bicycle Master Plan in 2009 and released the draft for public review and comments in 2010. The objective of the Bicycle Master Plan is to establish and maintain a

continuous, safe, and easily accessible bikeway system throughout the metropolitan area to facilitate bicycling as a viable transportation alternative and as a recreational activity. Bicycle use will reduce vehicle use, improve air quality, improve the quality of life, and provide public-health benefits (City of Fresno 2010a). Two existing bikeways are present within a 1-mile (1.6-kilometer) radius of the proposed Fresno HST station, as shown on Figure 4.2-7.

C. PEDESTRIAN ACCESS

Sidewalks for pedestrian access are present on most of the streets in the vicinity of the station alternatives.

D. MAJOR PEDESTRIAN AND BICYCLE TRAFFIC GENERATORS

To determine and organize existing pedestrian and bicycle generators within 0.5 mile (0.8 kilometer) of the proposed Fresno HST station, five categories of activity centers were defined:

- Recreational/cultural/parks
- Major employers
- Retail shopping
- Educational institutions (e.g., high schools, colleges, and universities)
- Travel accommodations (e.g., hotels and airports)

Table 4.2-3 lists the activity centers within 0.5 mile (0.8 kilometer) of the proposed Fresno HST stations.

Table 4.2-3
Activity Centers within 0.5-Mile (0.8 Kilometer) of the Proposed Fresno HST Station

Pedestrian/Bicycle Traffic Generator	Location	Activity Center Category
Downtown Fresno	Generally bounded by SR 41, SR 99, and SR 180	• Major employment center • 120 retail stores • 80 restaurants
Note: All pedestrian and bicycle traffic generators listed above are in the Downtown Fresno area. HST high-speed train SR State Route		

4.2.9 Parking Facilities

The City of Fresno owns and operates 10 parking lots and garages that provide event, monthly, or daily parking in Downtown Fresno (City of Fresno 2009). Figure 4.2-8 shows the locations of the existing parking garages owned by the City of Fresno.

The following garages are present in Downtown Fresno:

- Garage 4, Tulare Avenue and Fulton Mall: Parking Garage 4 is at 1919 Tulare Street at the corner of Tulare and Fulton Mall. This is a three-story garage with a total of 313 parking stalls, including 7 spaces for disabled drivers.

- Garage 7, Van Ness and Inyo avenues: Parking Garage 7 is also known as the Spiral Garage and is located at 801 Van Ness Avenue at the corner of Van Ness and Inyo avenues. This garage features four levels and has 587 stalls with 15 spaces for disabled drivers.

- Garage 8, Tulare Avenue and Van Ness avenues: Parking Garage 8 is at 1077 Van Ness Avenue and is an underground garage which runs along several city blocks.
- Garage 9, Van Ness Avenue and Merced Street: Garage 9 is at 2020 Merced Street; this garage has capacity for 213 vehicles.
- Convention Center Garage, Inyo and O streets: The New Convention Center parking structure features five levels and 1,565 parking spaces including 8 motorcycle spaces and 26 spaces for disabled drivers.
- Lot 2, Broadway and H streets: This public parking lot has approximately 210 parking stalls including 10 spaces for disabled drivers and 1 motorcycle-dedicated stall.
- Promenade Lot, Tulare Avenue and R Street: This public parking lot is at 2710 Tulare Street and has 750 parking stalls; 14 are spaces for disabled drivers.
- Stadium Lot, H and Kern streets: Stadium Lot is on H Street between Kern Street and Inyo Street. The lot has 525 parking stalls, including 1 motorcycle stall and 12 parking spaces for disabled drivers.
- Boxcar Lot, H and Tuolumne streets: This lot is on the western section of Downtown Fresno and has 525 parking stalls, 11 are for drivers with disabilities. This location is a pick-up and drop-off point for the downtown trolley.
- Lot 3, Fulton and Mariposa malls: Lot 3 is a small lot between Fulton Mall and Mariposa Mall consisting of 22 parking stalls. Parking in this lot is limited to monthly permit holders only, many of whom are mall employees or business owners.

4.2.10 Freight and Goods Movement

Freight and goods movement is accomplished in the area through truck cartage and rail freight services. The following paragraphs describe both services and their use.

A. TRUCK ROUTES

Multiple truck routes pass near the proposed Fresno station. The designated truck routes are listed below (City of Fresno 2010b):

- N. Blackstone Avenue, between Belmont Avenue and Divisadero Street
- Abby Street. between Belmont Avenue and Divisadero Street
- Divisadero Street, between G Street and P Street
- Stanislaus Street, between B Street and P Street
- Tuolumne Street, between A Street and P Street
- P Street, between Stanislaus Street and Ventura Street
- M Street, between Stanislaus Street and Ventura Street
- Ventura Street, between B Street and R Street

B. FREIGHT RAIL AND TRAIN MOVEMENTS

Within the city of Fresno, the Union Pacific Railroad and BNSF Railway provide freight service.

4.3 Kings/Tulare Regional Station Area

The Kings/Tulare Regional Station would be located in rural agricultural lands, 3 miles east of the city of Hanford. The location is adjacent to the San Joaquin Valley Railroad and northeast of the

SR 43 and SR 198 interchange, from which it would be accessed. SR 198 is two lanes in each direction west of SR 43, and one lane in each direction east of SR 43. SR 43 is one lane in each direction within the study area.

4.3.1 Kings/Tulare Regional Station Study Area

The study area for the proposed HST station in the city of Hanford was developed based on the *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002). Nine study intersections and thirteen roadway segments were determined for analysis in this report. The study intersections are illustrated on Figure 4.3-1.

A. STUDY INTERSECTIONS

The study intersections chosen for analysis are as follows:

- Ninth Avenue/SR 198
- Eighth Avenue/SR 198 westbound ramps
- Eighth Avenue/SR 198 eastbound ramps
- Seventh Street/SR 198
- Seventh Street/Seventh Road
- Sixth Street/SR 198
- Second Avenue/SR 198
- SR 43/Lacey Boulevard
- SR 43/Grangeville Boulevard

B. ROADWAY SEGMENTS

The roadway segments chosen for analysis are listed below:

- SR 198, between Eleventh Street and 10th Avenue
- SR 198, between Tenth Avenue and Ninth Avenue
- SR 198, between Ninth Avenue and Eighth Avenue/SR 43
- Eighth Avenue/SR 43, between Grangeville Boulevard and SR 198 ramps
- Eighth Avenue/SR 43, between SR 198 ramps and Hanford Armona Road
- SR 198, between SR 198 ramps and Seventh Avenue
- SR 198, between Seventh Avenue and 6th Avenue
- SR 198, between Sixth Avenue and Road 28
- SR 198, between Road 28 and Road 48
- SR 198, between Road 48 and Road 56/Seventeenth Avenue
- SR 198, between Road 56/Seventeenth Avenue and County Road 60
- SR 198, between County Road 60 and County Road J25/Road 68
- SR 198, between County Road J25/Road 68 and SR 99 ramps

4.3.2 Highways and Roads

The area surrounding the proposed Kings/Tulare Regional Station has a street network consisting of freeways, arterials, collectors, and local streets.

SR 198 is an important regional route serving Kings County. This east-west route originates at U.S. 101 in Monterey County and continues easterly across the Sierra Madre mountain range through Coalinga to an intersection on I-5. From that point SR 198 extends easterly through Kings County into Hanford and onto an interchange on SR 99. The route then continues to Visalia before terminating at Sequoia National Park in Tulare County. In the vicinity of the proposed project, SR 198 is a four-lane controlled-access facility, with access limited to grade-separated interchanges.

Houston Avenue is an east-west arterial street serving southern Hanford. Houston Avenue originates in Lemoore and continues easterly across SR 198 to SR 43. Hanford General Plan envisions the eventual improvement of Houston Avenue to a four-lane arterial street.

Hanford Armona Road is an arterial street that links the communities of Lemoore and Hanford. Hanford Armona Road exits the city of Lemoore (Blake Street) and continues easterly across and roughly parallel to SR 198. The road continues through Armona and Hanford to Tenth Avenue and east of Ninth Avenue across SR 43 to Sixth Avenue.

Lacey Boulevard is the major east-west route through Hanford. This designated arterial extends from the rural area of Kings County north of Lemoore through the Twelfth Avenue intersection to a downtown intersection at Irwin Street. E. Lacey Boulevard then begins at Tenth Avenue and continues easterly to an intersection on SR 43. In the area of the Twelfth Avenue intersection Lacey Boulevard is a four-lane street. The road narrows to a two-lane section west of the Twelfth Avenue intersection near the western city limits.

Figure 4.3-2 illustrates study roadway segments and shows the ADT, number of lanes, and speed within approximately 1 mile (1.6 kilometers) of the potential Kings/Tulare Regional Station.

4.3.3 Existing Arterial Traffic Volumes and Levels of Service

An analysis of daily operating conditions on 13 existing roadway segments was conducted. The purpose of conducting the roadway segment analysis was to determine the current adequacy of the roadways and to provide a baseline for future comparison of the roadway segments. The study roadway segments analyzed were determined based on the major roadways that will be used for ingress and egress to the proposed Kings/Tulare Regional HST station. URS personnel collected the ADT volumes at the study roadway segments during March 2010, and evaluated the capacities based on the roadway capacities given in the Florida tables. The ADT volumes are provided in Appendix A (Traffic Counts Data). Roadway segment analysis results are summarized in Table 4.3-1. As illustrated in Table 4.3-1, roadway segments operate at LOS D, or better, with the exception of the following roadway segments:

- SR 198, between SR 198 ramps and Seventh Avenue
- SR 198, between Seventh Avenue and Sixth Avenue
- SR 198, between Sixth Avenue and Second Avenue
- SR 198, between Second Avenue and Road 48
- SR 198, between Road 48 and Road 56/Seventeenth Avenue
- SR 198, between Road 56/Seventeenth Avenue and County Road 60
- SR 198, between County Road 60 and County Road J25/Road 68

Table 4.3-1
Roadway Segments Existing Daily Traffic Volumes and Level of Service: Kings/Tulare Regional Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	LOS
1	SR 198, between 11th Ave. and 10th Ave.	13,138	2/2	Divided	D
2	SR 198, between 10th Ave. and 9th Ave.	20,380	2/2	Divided	D
3	SR 198, between 9th Ave. and 8th Ave./SR 43	21,050	2/2	Divided	D

Table 4.3-1
Roadway Segments Existing Daily Traffic Volumes and Level of Service: Kings/Tulare Regional Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	LOS
4	8th Ave./SR 43, between Grangeville Blvd. and SR 198 Ramps	9,364	1/1	Undivided	D
5	8th Ave./SR 43, between SR 198 Ramps and Hanford Armona Rd.	9,780	1/1	Undivided	D
6	SR 198, between SR 198 Ramps and 7th Ave.	19,060	1/2 followed by 1/1	Divided/ Undivided	D or F
7	SR 198, between 7th Ave. and 6th Ave.	19,500	1/1	Undivided	F
8	SR 198, between 6th Ave. and 2nd Ave.	18,194	1/1	Undivided	F
9	SR 198, between 2nd Ave. and Road 48	18,574	1/1	Undivided	F
10	SR 198, between Road 48 and Road 56/17th Ave	19,458	1/1	Undivided	F
11	SR 198, between Road 56/17th Ave and County Road 60	18,738	1/1	Undivided	F
12	SR 198, between County Road 60 and County Road J25/Road 68	18,884	1/1	Undivided	F
13	SR 198, between County Road J25/Road 68 and SR 99 Ramps	19,032	2/2	Divided	D

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).

ADT	average daily traffic
LOS	level of service
NE	northeast
SW	southwest
SR	State Route

4.3.4 Existing Intersection Traffic Volumes and Levels of Service

URS personnel collected peak-hour (AM and PM) turning-movement volumes at the study intersections during March 2010 between 7 to 9 a.m. and 4 to 6 p.m., respectively. Because collecting the AM and PM peak-hour volumes would capture the general commute times of the high-speed train users, the effort to establish peak-hour volumes will not require an evaluation of other critical peak-hour periods.

The existing lane geometries and traffic control are illustrated on Figure 4.3-3. The existing peak-hour turning-movement volumes at the study intersections are illustrated on Figure 4.3-4 and are provided in Appendix A (Traffic Counts Data).

The LOS analysis was conducted based on the methodology documented in the earlier section using Synchro Software. Detailed calculations for the LOS analysis are provided in Appendix B (Existing Synchro Output). Table 4.3-2 summarizes the result of the LOS analysis.

As illustrated in Table 4.3-2, all intersections under existing conditions operate at acceptable LOS, except the following intersections:

- Seventh Street/SR 198
- Sixth Street/SR 198
- Second Avenue/SR 198

Figure 4.3-5 illustrates the LOS at the study intersections under existing conditions. The intersections of Seventh Street/SR 198 and Sixth Street/SR 198 operate at unacceptable levels during both peak hours. The intersection of Second Avenue/SR 198 operates at unacceptable levels during the PM peak hour.

Table 4.3-2
Existing Peak-Hour Intersection Level of Service: Kings/Tulare Regional Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay(s)	LOS	Delay(s)	LOS
1	9th Ave./SR 198	Two-Way Stop	13.4	B	13.0	B
2	8th Ave./SR 198 Westbound Ramps	One-Way Stop	12.7	B	13.9	B
3	8th Ave./SR 198 Westbound Ramps	One-Way Stop	13.1	B	13.6	B
4	7th St./SR 198	Two-Way Stop	239.0	F	141.0	F
5	7th St./7th Rd.	Not Used				
6	6th St./SR 198	Two-Way Stop	51.3	F	72.8	F
7	2nd Ave./SR 198	Two-Way Stop	29.6	D	55.8	F
8	SR 43/Lacey Blvd.	One-Way Stop	32.1	D	27.4	D
9	SR 43/Grangeville Blvd.	Signalized	24.1	C	18.0	B

Note: Delay represented is the average delay at signalized intersections and the average delay on controlled approaches at unsignalized intersections. Delay is in seconds per vehicle.

ADT average daily traffic
AM morning
LOS level of service
PM afternoon
SR State Route

4.3.5 Planned General Plan Improvements

The following describes the planned improvements in the study area documented in the Kings County Regional Transportation Improvement Program (Kings County Association of Governments 2010).

- SR 198 from SR 43 to SR 99. Widen from two lanes to four lanes; construction began in November 2009.

4.3.6 Transit, Taxis, and Shuttles

The city of Hanford and the surrounding areas are served by a number of public, private, and social service transportation organizations. The following paragraphs describe some of these transit services.

A. KINGS COUNTY AREA PUBLIC TRANSIT AGENCY

The largest provider of public transit services within Kings County is the Kings County Area Public Transit Agency (KCAPTA). KCAPTA is an intra-governmental agency with representatives from

Avenal, Kings County, Hanford, and Lemoore, and is responsible for the operation of Kings Area Rural Transit (KART). The City of Hanford has taken steps within its authority to reduce vehicle miles traveled in the city. The city supports the KART System that operates three services in Hanford: KART dial-a-ride, a scheduled fixed-route bus service in the central Hanford area, and regular service to Lemoore, Avenal, Corcoran, and Visalia. Special trips are provided to Fresno for medical services once a week.

KART offers scheduled daily bus service from Hanford to Armona, Lemoore, the Lemoore Naval Air Station, Visalia, Corcoran, Stratford, Kettleman City, and Avenal. The KART dial-a-ride operates from 7:00 a.m. to 11:00 p.m. Monday through Friday, and on Saturday from 9:00 a.m. to 4:00 p.m. The City of Hanford Fixed-Route System provides a linkage from existing neighborhoods to all parts of the city.

B. PRIVATE TRANSIT SERVICES

Private transit services are currently provided in Hanford by three taxicab companies (Hanford Taxi, Marathon Cab, and Central Valley Cab). Orange Belt Stages provides east/west bus service. Orange Belt Stages offers scheduled bus service four times a day to Goshen and Visalia, one bus per day to Paso Robles, and one bus per day to Fresno. The service to Paso Robles provides a link through Greyhound connections to the coastal communities. Service to Fresno also provides connecting service through Greyhound to northern and southern destinations.

C. AMTRAK

Hanford is served by Amtrak passenger rail service on the BNSF Railway facility near Lacey Boulevard and Eleventh Avenue. Currently, several northbound and southbound trains operate through the community each day. Northbound service connects Hanford with the Bay Area and Sacramento, while southbound service connects with Bakersfield and southern California. Amtrak feeder bus service is currently provided to and from the Hanford station to Tulare County. This bus service connects Porterville, Lindsay, and Visalia with the Amtrak trains.

The Hanford Municipal Airport is the only publicly owned airport in Kings County. The airport enforces city, state, and federal aviation regulations, and administers airport leases, tie-downs, hangars, shelters, and their overall maintenance. The airport completed a major extension of its runway in September 2000. The runway is now 5,175 feet (1,577 meters) long, and will accommodate most business jets and general aviation traffic. The airport is for general aviation and does not offer commercial flights.

4.3.7 Nonmotorized Transportation

In 1994, Kings County Association of Governments prepared the Kings County Regional Bicycle Plan to foster the implementation of bicycling improvement projects as transportation and control measures for air quality purposes (Kings County Association of Governments 2005). The plan was updated in 1998.

A. PEDESTRIAN ACCESS

There is no direct pedestrian access to the proposed HST station.

B. MAJOR PEDESTRIAN AND BICYCLE TRAFFIC GENERATORS

There are no major pedestrian and bicycle traffic generators in the area.

4.3.8 Parking Facilities

There are no parking facilities near the proposed HST station sites.

4.3.9 Freight and Goods Movement

Freight and goods movement is accomplished in the area through truck cartage and rail freight services. The following paragraphs describe both services and their use.

A. TRUCK ROUTES

There are multiple truck routes near the proposed Kings/Tulare Regional Station. The designated truck routes are listed below (City of Hanford 2010).

- SR 198, between Tenth Avenue and Ninth Avenue
- SR 198, Ninth Avenue and Eighth Avenue/SR 43
- SR 198, between SR 198 ramps and Seventh Avenue
- SR 198, between Seventh Avenue and Sixth Street
- SR 198, between Second Avenue and Road 48
- SR 198, between Road 48 and Road 56/Seventeenth Avenue
- SR 198, between Road 56/Seventeenth Avenue and County Road 60
- SR 198, between County Road 60 and County Road J25/Road 68
- SR 198, between County Road J25/Road 68 and SR 99 ramps

B. FREIGHT RAIL AND TRAIN MOVEMENTS

Both the BNSF Railroad and San Joaquin Valley Railroad (SJVRR) serve Hanford. These rail lines cross in Hanford near the central business district. Rail lines have historically been an important part of Hanford's economic and transportation development. BNSF and SJVRR provide freight service to the Hanford area. The BNSF railroad currently operates between 40 and 50 trains per day on the system. Over time, it is expected that the number of trains using the system will increase as demand for rail service increases. SJVRR has a limited schedule of one train per day.

4.4 Bakersfield Station Area

The general location of the Bakersfield HST station alternatives is west of Union Street, between Truxtun and California avenues. Each of these roadways has two to three lanes in each direction, generally with divided medians except near intersections. Union Street has an undercrossing at the BNSF railroad line. The site and vicinity include the Bakersfield Amtrak station facilities and a BNSF freight service yard.

The area surrounding the proposed Bakersfield HST station is highly developed, with a variety of lane uses. Within a 0.5-mile (0.8-kilometer) radius of the station, development consists almost entirely of commercial, industrial, and residential land uses. The city's downtown is north of the proposed station.

4.4.1 Bakersfield Station Study Area

The study area for the proposed HST station in Bakersfield was developed through discussions with staff from the City of Bakersfield. Based on discussion with city staff, 67 study intersections and 46 roadway segments were determined to be included in the analysis for the project. The study intersections and roadway segments are listed below. The study intersections are illustrated on Figure 4.4-1.

A. STUDY INTERSECTIONS

- S. Union Avenue/eastbound SR 58 ramps
- Mt. Vernon Avenue/eastbound SR 58 ramps
- Wible Road/Oak Street/Brundage Lane/Stockdale Highway
- Chester Avenue/Brundage Lane
- P Street/Brundage Lane
- S. Union Avenue/E. Brundage Lane
- Liggett Street and E. Brundage Lane
- Mt. Vernon Avenue/E. Brundage Lane
- Chester Avenue/Fourth Street
- P Street/Fourth Street
- Union Avenue/Fourth Street
- Chester Avenue/Eighth Street
- P Street/Eighth Street
- Real Road/California Avenue
- SR 99 ramps/California Avenue
- Oak Street/California Avenue
- A Street/California Avenue
- Oleander Avenue/California Avenue
- H Street/California Avenue
- Chester Avenue/California Avenue
- N Street/California Avenue
- P Street/California Avenue
- Union Avenue/California Avenue
- King Street/California Avenue
- Owens Street/California Avenue
- Martin Luther King Jr. Boulevard/Haley Street/California Avenue
- Mt. Vernon Avenue/California Avenue
- Q Street/Fourteenth Street
- Union Avenue/Hayden Court
- Oak Street/Truxtun Avenue
- F Street/Truxtun Avenue
- H Street/Truxtun Avenue
- Chester Avenue/Truxtun Avenue
- L Street/Truxtun Avenue
- N Street/Truxtun Avenue
- Q Street/Truxtun Avenue
- E. Truxtun Avenue/Beale Avenue/E. Nineteenth Street
- Q Street/Nineteenth Street
- F Street/Twenty-first Street
- Q Street/Twenty-first Street
- Union Avenue/Golden State Avenue/Twenty-first Street
- F Street/Twenty-third Street
- Chester Avenue/Twenty-third Street
- Q Street/Twenty-third Street
- SR 178/SR 99 Southbound Ramps
- SR 178/SR 99 Ramps/Buck Owens Blvd
- Oak Street/SR 178
- F Street/Twenty-fourth Street
- Chester Avenue/Twenty-fourth Street
- Beale Avenue/Monterey Street
- Q Street/Golden State Avenue

- Union Avenue/Espee Street
- Beale Avenue/Niles Street
- William Street/Niles Street
- Mt. Vernon Avenue/Niles Street
- M Street/Twenty-eighth Street/Golden State Avenue
- Union Avenue/W. Niles Street
- F Street/Thirtieth Street
- Beale Avenue/Flower Street
- F Street/Golden State Avenue
- Beale Avenue/Jefferson Street
- Chester Avenue/Thirty-fourth Street
- Union Avenue/Thirty-fourth Street/Bernard Street
- Chester Avenue/W. Columbus Street
- Union Avenue/Columbus Street
- Chester Avenue/Thirtieth Street/SR 99 ramps and Thirtieth Street
- L Street/California Street

B. ROADWAY SEGMENTS

- California Avenue, between Real Road and Oak Street
- California Avenue, between Oak Street and A Street
- California Avenue, between N Street and P Street
- California Avenue, between P Street and Union Avenue
- California Avenue, between Union Avenue and Beale Avenue
- California Avenue, between Martin Luther King Jr. Boulevard and Mt. Vernon Avenue
- P Street, between Eighth Street and California Avenue
- Q Street, between California Avenue and Fourteenth Street
- Chester Avenue, between Twenty-fourth Street and Thirtieth Street
- Brundage Lane, between Chester Avenue and Oak Street
- Union Avenue, between Brundage Lane and Fourth Street
- Union Avenue, between Fourth Street and California Avenue
- Union Avenue, between California Avenue and Hayden Court
- Union Avenue, between Hayden Court and Twenty-first Street
- Union Avenue, between Twenty-first Street and Espee Street
- SR 178, between Oak Street and Buck Owens Boulevard/SR 99 northbound ramps
- SR 178, between Twenty-third Street and Chester Avenue
- Beale Avenue, between Truxtun Avenue and Monterey Street
- Beale Avenue, between Niles Street and Flower Street
- Beale Avenue, between Truxtun Avenue and California Avenue
- Mt. Vernon Avenue, between Brundage Lane and California Avenue
- Truxtun Avenue, between Oak Street and F Street
- Truxtun Avenue, between Oak Street and Bahamas Drive
- Truxtun Avenue, between Q Street and Beale Avenue
- Chester Avenue, between Thirtieth Street and Thirty-Fourth Street
- F Street, between Golden State Avenue and Thirtieth Street
- F Street, between Thirtieth Street and Twenty-Fourth Street
- F Street, between Twenty-Fourth Street and Twenty-Third Street
- F Street, between Twenty-Third Street and Twenty-First Street
- F Street, between Twenty-First Street and Truxtun Avenue
- Twenty-Third Street, between Twenty-Fourth Street and F Street
- Twenty-Third Street, between F Street and Chester Avenue
- Oak Street, between SR 178 and Truxtun Ave.
- Truxtun Avenue, between F Street and Chester Avenue

- Truxtun Avenue, between Chester Avenue and Q Street
- California Avenue, between A Street and Chester Avenue
- Chester Avenue, between California Avenue and Fourth Street
- Chester Avenue, between Fourth Street and Brundage Lane
- California Avenue, between S. King Street and S. Owens Street
- California Avenue, between S. Owens Street and Mt. Vernon Avenue
- Monterey Street, between Beale Avenue and Williams Street
- Niles Street, between Beale Avenue and Williams Street
- Q Street, between Twenty-Third Street and Nineteenth Street
- Q Street, between Nineteenth Street and Truxtun Avenue
- Chester Avenue, between Twenty-Third Street and Truxtun Avenue
- Chester Avenue, between Truxtun Avenue and California Avenue

4.4.2 Highways and Roads

The area surrounding the proposed Bakersfield HST station has a street network consisting of arterials, collectors, and local streets generally laid out in a grid pattern. In addition to the arterial system there are three freeways that would provide access to the proposed Bakersfield HST: SR 99, SR 58, and SR 178.

Commonly known as Highway 99 or 99, SR 99 is a north–south state highway in California, stretching almost the entire length of the Central Valley. From its southern end at Interstate 5 near Wheeler Ridge to its northern end at SR 36 near Red Bluff, SR 99 is a busy alternative to I-5 through the more populated eastern portions of the valley. Cities near or passed through by SR 99 include Bakersfield, Visalia, Fresno, Madera, Merced, Modesto, Stockton, Sacramento, Yuba City, and Chico. Almost all of SR 99 south of Sacramento is a freeway, and there are current plans to complete this southern portion to interstate highway standards, as a parallel route to I-5 for Los Angeles-Sacramento traffic. This route is part of the California Freeway and Expressway System.

SR 58 is an east–west highway across the southern San Joaquin Valley; the Tehachapi Mountains, which border the southern Sierra Nevada; and the Mojave Desert. It runs between its western terminus near Santa Margarita (junction U.S. Route 101) and its eastern terminus at Barstow (junction I-15). It has junctions with Interstate 5 near Buttonwillow, SR 99 in Bakersfield, SR 202 in Tehachapi, SR 14 in Mojave, and U.S. Route 395 at Kramer Junction. Route 58 gives good access to Edwards Air Force Base. The portion of the 58 from Barstow to Bakersfield is sometimes referred to as the Barstow–Bakersfield Highway.

SR 178 is a route that exists in two constructed segments. The gap between segments is connected by various local roads and SR 190 through Death Valley National Park. SR 178 serves many different purposes. It connects SR 99 and Downtown Bakersfield with East Bakersfield and Lake Isabella.

The classification of the roadways according to the Bakersfield General Plan is as follows:

Arterial: Four- to six-lane divided roadways. City of Bakersfield design calls for six lanes with no parking, whereas Kern County design calls for four lanes with parking allowed. The arterials are 90 feet (27.4 meters) wide in 110 feet (33.5 meters) of right-of-way.

Collector: Two- to four-lane undivided roadways, with the primary function of connecting local streets and arterials and neighborhood traffic generators and providing access to abutting properties. The collectors are 68 feet (20.7 meters) wide in 90 feet (27.4 meters) of right-of-way.

Local: Two-lane undivided roadways designed to provide direct access to properties while discouraging through traffic between major streets. The local streets are 36 feet (11 meters) to 44 feet (13.4 meters) wide.

Figure 4.4-2 illustrates study roadway segments and provides the ADT, number of lanes, and speed within approximately 1 mile (1.6 kilometers) of the proposed Bakersfield station.

4.4.3 Existing Arterial Traffic Volumes and Levels of Service

An analysis of existing roadway segments' daily operating conditions was conducted based on the volume-to-capacity ratio. A total of 46 roadway segments were identified for analysis. The purposes of conducting the roadway segment analysis are to determine the current adequacy of the roadways, and to provide a baseline for future comparison of the roadway segments. The study roadway segments analyzed have been determined based on major roadways that will be used for ingress and egress to the Bakersfield HST station.

URS personnel collected the ADT volumes at the study roadway segments during December 2009 and evaluated the capacities based on the roadway capacities shown in the City of Bakersfield General Plan. The roadway capacities used for the analysis are as follows:

- Six-Lane Arterial – 60,000 vehicles per day
- Four-Lane Arterial – 40,000 vehicles per day
- Four-Lane Collector – 30,000 vehicles per day
- Two-Lane Collector – 15,000 vehicles per day

The ADT volumes are provided in Appendix A (Traffic Counts Data). Roadway segment analysis results are summarized in Table 4.4-1. As shown in Table 4.4-1, all roadway segments operate at LOS C or better, except the following:

- SR 178, between Oak Street and Buck Owens Boulevard/SR 99 Northbound ramps
- SR 178, between Twenty-third Street and Chester Avenue
- Truxtun Avenue, between Oak Street and Bahamas Drive
- Twenty-third Street, between Twenty-Fourth Street and F Street
- Twenty-third Street, between F Street and Chester Avenue

Table 4.4-1
Roadway Segments Existing Daily Traffic Volumes and LOS: Bakersfield Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	Volume-to-Capacity Ratio	LOS
1	California Ave., between Real Rd. and Oak St.	39,594	2/3	Divided	0.79	C
2	California Ave., between Oak St. and A St.	23,646	2/3	Divided	0.47	A
3	California Ave., between N St. and P St.	17,130	3/3	Divided	0.29	A
4	California Ave., between P St. and Union Ave.	15,250	3/3	Divided	0.25	A
5	California Ave., between Union Ave. and Beale Ave.	18,142	3/3	Divided	0.30	A

Table 4.4-1
Roadway Segments Existing Daily Traffic Volumes and LOS: Bakersfield Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	Volume-to-Capacity Ratio	LOS
6	California Ave., between Martin Luther King Jr. Blvd. and Mt. Vernon Ave.	11,734	3/3 and 2/2	Divided	0.20 and 0.30	A
7	P St., between 8th St. and California Ave.	5,280	1/1	Undivided	0.35	A
8	Q St., between California Ave. and 14th St.	8,146	2/2	Undivided	0.27	A
9	Chester Ave., between 24th St. and 30th St.	17,164	2/2	Divided	0.43	A
10	Brundage Ln., between Chester Ave. and Oak St.	13,182	2/2	Undivided	0.44	A
11	Union Ave., between Brundage Ln. and 4th St.	31,544	3/3	Divided	0.53	A
12	Union Ave., between 4th St. and California Ave.	30,506	3/3	Divided	0.51	A
13	Union Ave., between California Ave. and Hayden Ct.	31,286	3/3	Divided	0.52	A
14	Union Ave., between Hayden Ct. and 21st St.	29,760	3/3	Divided	0.50	A
15	Union Ave., between 21st St. and Espee St.	22,460	3/3	Divided	0.37	A
16	SR 178, between Oak St. and Buck Owens Blvd./SR 99 Northbound Ramps	54,384	3/3	Divided	0.91	E
17	SR 178, between 23rd St. and Chester Ave.	28,878	0/3	One-Way	0.96	E
18	Beale Ave., between Truxtun Ave. and Monterey St.	13,398	2/2	Divided	0.33	A
19	Beale Ave., between Niles St. and Flower St.	11,184	2/2	Divided	0.28	A
20	Beale Ave., between Truxtun Ave and California Ave.	1,700	1/1	Undivided	0.11	A
21	Mt. Vernon Ave., between Brundage Ln. and California Ave.	21,498	2/2	Divided	0.54	A
22	Truxtun Ave., between Oak St. and F St.	21,804	2/2	Divided	0.55	A
23	Truxtun Ave., between Oak St. and Bahamas Dr.	38,822	2/2	Divided	0.97	E
24	Truxtun Ave., between Q St. and Beale Ave.	12,584	3/3	Divided	0.21	A
25	Chester Ave., between 30th St. and 34th St.	24,030	2/2	Divided	0.60	A

Table 4.4-1
Roadway Segments Existing Daily Traffic Volumes and LOS: Bakersfield Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	Volume-to-Capacity Ratio	LOS
26	F St., between Golden State Ave. and 30th St.	15,408	2/2	Undivided	0.51	A
27	F St., between 30th St. and 24th St.	13,268	2/2	Undivided	0.44	A
28	F St., between 24th St. and 23rd St.	17,034	2/2	Divided	0.43	A
29	F St., between 23rd St. and 21st St.	12,058	2/2	Undivided	0.40	A
30	F St., between 21st St. and Truxtun Ave.	8,394	2/2	Undivided	0.28	A
31	23rd St., between 24th St. and F St.	25,772	2/0 and 3/0	One-Way	1.29 and 0.86	F and D
32	23rd St., between F St. and Chester Ave.	26,362	3/0	One-Way	0.88	D
33	Oak St., between SR 178 and Truxtun Ave.	23,914	2/2	Undivided	0.80	C
34	Truxtun Ave., between F St. and Chester Ave.	20,432	2/2	Divided	0.51	A
35	Truxtun Ave., between Chester Ave. and Q St.	14,218	3/3	Divided	0.24	A
36	California Ave., between A St. and Chester Ave.	22,042	2/3 and 3/3	Divided	0.44 and 0.37	A
37	Chester Ave., between California Ave. and 4th St.	15,118	2/2	Undivided	0.50	A
38	Chester Ave., between 4th St. and Brundage Ln.	15,660	2/2	Undivided	0.52	A
39	California Ave., between S. King St. and S. Owens St.	13,894	3/3	Divided	0.23	A
40	California Ave., between S. Owens St. and Mt. Vernon Ave.	11,754	3/3	Divided	0.20	A
41	Monterey St., between Beale Ave. and Williams St.	6,524	3/0	One-Way	0.22	A
42	Niles St., between Beale Ave. and Williams St.	6,776	0/3 and 2/2	Divided	0.23 and 0.17	A
43	Q St., between 23rd St. and 19th St.	7,292	1/1	Undivided	0.49	A
44	Q St., between 19th St. and Truxtun Ave.	8,192	1/1	Undivided	0.55	A
45	Chester Ave., between 23rd St. and Truxtun Ave.	18,550	2/2	Divided	0.46	A
46	Chester Ave., between Truxtun Ave. and California Ave.	17,898	2/2	Divided	0.45	A

Table 4.4-1
Roadway Segments Existing Daily Traffic Volumes and LOS: Bakersfield Station

No.	Roadway Segment	ADT	Number of Lanes (NE or SW)	Divided/ Undivided	Volume-to-Capacity Ratio	LOS

Note: LOS is based on volume-to-capacity ratios.

ADT	average daily traffic
LOS	level of service
NE	northeast
SR	State Route
SW	southwest

4.4.4 Existing Intersection Traffic Volumes and Levels of Service

URS personnel collected peak-hour (AM and PM) turning-movement volumes at the study intersections during December 2009. These turning-movement volumes were collected during the AM and PM peak hours, from 7 to 9 a.m. and 4 to 6 p.m., respectively. Because collecting the AM and PM peak-hour volumes would capture the general commute times of the high-speed train users, the effort to establish peak-hour volumes will not require an evaluation of other critical peak-hour periods.

The existing lane geometries and traffic control are illustrated on Figures 4.4-3a through 4.4-3d. The existing peak-hour turning movement volumes at the study intersections are illustrated on Figures 4.4-4a through 4.4-4d. The existing peak-hour turning-movement volumes are provided in Appendix A (Traffic Counts Data).

The LOS analysis was conducted based on the methodology documented in the earlier section using Synchro Software. Detailed calculations for the LOS analysis are provided in Appendix B (Existing Synchro Output). Table 4.4-2 summarizes the result of the LOS analysis.

As illustrated in Table 4.4-2, all intersections under existing conditions operate at LOS C or better, except the following 18 intersections.

- S. Union Avenue/Eastbound SR 58 ramps
- S. Union Avenue/E. Brundage Lane
- Real Road/California Avenue
- SR 99 ramps/California Avenue
- Oak Street/California Avenue
- Union Avenue/California Avenue
- Mt. Vernon Avenue/California Avenue
- Oak Street/Truxtun Avenue
- L Street/Truxtun Avenue
- Union Avenue/Golden State Avenue/Twenty-first Street
- F Street/Twenty-third Street
- Chester Avenue/Twenty-third Street
- SR 178/SR 99 ramps/Buck Owens Boulevard
- Oak Street/SR 178
- F Street/Twenty-fourth Street
- Chester Avenue/Twenty-fourth Street
- F Street/Golden State Avenue
- Union Avenue/Thirty-fourth Street/Bernard Street

Figure 4.4-5 illustrates the LOS at the study intersections under existing conditions.

Table 4.4-2
Existing Peak-Hour Intersection Level of Service: Bakersfield Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay(s)	LOS	Delay(s)	LOS
1	S. Union Ave./Eastbound SR 58 Ramps	Signalized	204.0	F	12.5	B
2	Mt. Vernon Ave./Eastbound SR 58 Ramps	Signalized	19.8	B	19.4	B
3	Wible Rd./Oak St./Brundage Ln./Stockdale Hwy.	Signalized	20.2	C	33.1	C
4	Chester Ave./Brundage Ln.	Signalized	21.6	C	24.6	C
5	P St./Brundage Ln.	Signalized	10.8	B	12.8	B
6	S. Union Ave./E. Brundage Ln.	Signalized	33.7	C	35.8	D
7	Liggett St. and E. Brundage Ln.	Signalized	19.8	B	19.8	B
8	Mt. Vernon Ave./E. Brundage Ln.	Signalized	23.7	C	26.9	C
9	Chester Ave./4th St.	Signalized	11.8	B	11.9	B
10	P St./4th St.	Signalized	5.5	A	6.0	A
11	Union Ave./4th St.	Signalized	10.6	B	12.6	B
12	Chester Ave./8th St.	Signalized	8.5	A	9.3	A
13	P St./8th St.	All-Way Stop	9.9	A	11.8	B
14	Real Rd./California Ave.	Signalized	48.2	D	60.7	E
15	SR 99 Ramps/California Ave.	Signalized	73.8	E	22.9	C
16	Oak St./California Ave.	Signalized	75.2	E	63.5	E
17	A St./California Ave.	Signalized	23.5	C	14.1	B
18	Oleander Ave./California Ave.	Signalized	9.2	A	5.7	A
19	H St./California Ave.	Signalized	26.5	C	30.4	C
20	Chester Ave./California Ave.	Signalized	29.0	C	33.0	C
21	N St./California Ave.	Signalized	5.6	A	6.4	A
22	P St./California Ave.	Signalized	17.2	B	19.8	B
23	Union Ave./California Ave.	Signalized	32.2	C	37.3	D
24	King St./California Ave.	Signalized	16.4	B	12.8	B
25	Owens St./California Ave.	Signalized	10.4	B	14.0	B
26	Martin Luther King Jr. Blvd./Haley St./ California Ave.	Signalized	13.7	B	9.2	A
27	Mt. Vernon Ave./California Ave.	Signalized	22.8	C	45.8	D

Table 4.4-2
Existing Peak-Hour Intersection Level of Service: Bakersfield Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay(s)	LOS	Delay(s)	LOS
28	Q St./14th St.	Signalized	2.8	A	4.1	A
29	Union Ave./Hayden Ct.	Signalized	19.2	B	18.9	B
30	Oak St./Truxtun Ave.	Signalized	111.9	F	72.0	E
31	F St./Truxtun Ave.	Signalized	15.6	B	27.7	C
32	H St./Truxtun Ave.	Signalized	28.8	C	26.5	C
33	Chester Ave./Truxtun Ave.	Signalized	30.1	C	28.0	C
34	L St./Truxtun Ave.	Signalized	37.6	D	29.9	C
35	N St./Truxtun Ave.	Signalized	14.4	B	12.3	B
36	Q St./Truxtun Ave.	Signalized	19.7	B	22.3	C
37	E. Truxtun Ave./Beale Ave./E. 19th St.	Signalized	17.4	B	13.7	B
38	Q St./19th St.	Signalized	6.6	A	8.3	A
39	F St./21st St.	Signalized	7.8	A	9.4	A
40	Q St./21st St.	Signalized	9.4	A	8.3	A
41	Union Ave./Golden State Ave./21st St.	Signalized	25.8	C	89.4	F
42	F St./23rd St.	Signalized	45.6	D	44.7	D
43	Chester Ave./23rd St.	Signalized	61.3	E	90.7	F
44	Q St./23rd St.	Two-Way Stop	12.4	B	14.1	B
45	SR 178/SR 99 Southbound Ramps	Signalized	7.7	A	12.3	B
46	SR 178/SR 99 Ramps/Buck Owens Blvd.	Signalized	31.0	C	58.8	E
47	Oak St./SR 178	Signalized	84.6	F	72.3	E
48	F St./24th St.	Signalized	45.0	D	31.8	C
49	Chester Ave./24th St.	Signalized	60.4	E	59.0	E
50	Beale Ave./Monterey St.	Signalized	10.3	B	11.6	B
51	Q St./Golden State Ave.	Signalized	18.8	B	20.8	C
52	Union Ave./Espee St.	Signalized	14.0	B	16.7	B
53	Beale Ave./Niles St.	Signalized	12.8	B	11.2	B
54	William St./Niles St.	Two-Way Stop	10.7	B	10.4	B
55	Mt. Vernon Ave./Niles St.	Signalized	24.5	C	28.6	C
56	M St./28th St./Golden State Ave.	Signalized	14.4	B	28.6	C
57	Union Ave./W. Niles St.	Signalized	11.9	B	12.4	B

Table 4.4-2
Existing Peak-Hour Intersection Level of Service: Bakersfield Station

No.	Intersection	Control	Existing Conditions			
			AM Peak		PM Peak	
			Delay(s)	LOS	Delay(s)	LOS
58	F St./30th St.	Signalized	12.6	B	17.4	B
59	Beale Ave./Flower St.	Signalized	21.1	C	22.5	C
60	F St./Golden State Ave.	Signalized	24.5	C	45.8	D
61	Beale Ave./Jefferson St.	One-Way Stop	13.5	B	16.0	C
62	Chester Ave./34th St.	Signalized	18.6	B	24.4	C
63	Union Ave./34th St./Bernard St.	Signalized	53.6	D	31.2	C
64	Chester Ave./W. Columbus St.	Signalized	6.6	A	9.9	A
65	Union Ave./Columbus St.	Signalized	30.2	C	30.5	C
66	Chester Ave./30th St./SR 99 Ramps and 30th St.	Roundabout	---	---	---	---
67	L St./California St.	Signalized	2.9	A	3.2	A

Note: Delay represented is average delay at signalized intersections and average delay on controlled approaches at unsignalized intersections. Delay is in seconds per vehicle. Levels of Service defined in Table 3.1-1.

AM	morning
E.	east
LOS	level of service
N.	north
PM	afternoon
S.	south
SR	State Route
W.	west

4.4.5 Planned General Plan Improvements

The following are the planned improvements documented in the City of Bakersfield General Plan.

- Crosstown Freeway (Centennial Corridor): Construct from SR 178 to SR 99
- Westside Parkway (continuation of Crosstown Freeway): Construct from SR 99 to Interstate 5 (I-5)
- West Beltway: Construct from SR 99 to I-5
- South Beltway: Construct from SR 58 to I-5
- East Beltway: Construct from SR 178 to SR 58
- SR 178: Construct new alignment from near future Vineland Road northeasterly to Rancheria Road
- SR 178: Widen from Fairfax Road to Alfred Harrell Highway
- SR 58: Widen from SR 99 to Cottonwood Road

4.4.6 Transit, Taxis, and Shuttles

Public transportation in metropolitan Bakersfield includes local buses, intercity buses, Amtrak trains, and paratransit services. The largest local bus transit system operator is Golden Empire

Transit (GET). GET operates 18 routes throughout the Metropolitan area and carries approximately 24,000 passengers per day. This amounts to 1% of total travel in the city of Bakersfield.

Intercity bus operators are Greyhound, Orange Belt Stages, Airport Bus of Bakersfield, and Kern County. Kern Regional Transit provides service between Bakersfield and rural communities, such as Lamont and the Kern River Valley, while the private carriers serve other major cities. Paratransit providers include the taxicab system and various social service agencies that provide specialized transportation to their clients.

A. GOLDEN EMPIRE TRANSIT DISTRICT

The City of Bakersfield operates the Golden Empire Transit District; this is the main bus line. The District was formed in 1973 and serves the Bakersfield metropolitan area: 160 square miles (414.4 square kilometers) with a population of 437,236. GET has an active fleet of 81 buses plus 19 GET-A-Lift buses which are fueled by compressed natural gas, an alternative fuel that helps reduce pollution emissions. All buses are equipped with wheelchair lifts and bike racks.

Each weekday approximately 24,000 citizens ride one of GET's 81 buses. The latest survey shows 56% of the riders have no other mode of transportation. Table 4.4-3 illustrates the bus routes for the Bakersfield Transit System, GET (Golden Empire Transit District 2009).

Table 4.4-3
Bus Routes: Bakersfield

Bus Route	Frequency (min) on Weekdays
Route 1: Olive Dr./Bakersfield College	40
Route 2: Chester Ave./Oildale	20
Route 3: Downtown	30
Route 4: Bakersfield College/Downtown	20
Route 5: Bakersfield College/Valley Plaza	20
Route 6: Valley Plaza/East Hills	60
Route 7: Stockdale High/Kern Medical Center	30
Route 8: Foothill High/Valley Plaza	30
Route 9: Foothill/Half Moon	30
Route 16: Replaced by Route 10	40
Route 11: Cal State/Bakersfield College	30
Route 12: Westchester	45
Route 14: Rosedale/Cal State	45
Route 15: Mervyn's/Valley Plaza	60
Route 17: Crosstown Express	30

Figure 4.4-6 illustrates the transit routes serving the proposed Bakersfield station.

B. TAXIS

Currently there are several taxi and limousine companies serving the city of Bakersfield. The taxi and limousine companies provide private transportation to and from the existing Amtrak Bakersfield station and the proposed HST station area.

C. AMTRAK

Amtrak provides rail service to and from Bakersfield. The Amtrak station is at Truxtun Avenue and S Street. Other existing rail lines in the metropolitan Bakersfield area include two major railroads that provide freight service to Bakersfield: BNSF Railway and Southern Pacific. The BNSF and Southern Pacific yard is in East Bakersfield between Kentucky and Sumner streets. The Southern Pacific railroad parallels SR 99 and Golden State Highway, along the eastern boundary of the proposed project site.

4.4.7 Airports

The Bakersfield Municipal Airport is owned by the City of Bakersfield. The airport is home to over 100 general aviation aircraft. Bakersfield Municipal Airport is approximately 3.5 miles (5.6 kilometers) south of the downtown area of Bakersfield. Union Avenue provides the most direct access to the airport. The airport covers approximately 200 acres (0.8 square kilometer). The airport is certified under Federal Aviation Regulations Part 139 which governs land-based airport operations.

4.4.8 Nonmotorized Transportation

A. RECREATIONAL TRAILS

The park system within the jurisdiction of the City of Bakersfield includes over 50 parks, recreational facilities, and trails such as the Kern River Parkway.

B. BIKEWAYS

Bicycling accounts for a small proportion of total miles traveled within the city of Bakersfield–less than 2%; however, the relatively flat terrain and fair weather conditions are conducive to bicycling to work, recreation activities, and school. *The Metropolitan Bakersfield General Plan* estimated that at present, up to one-third of the city population uses bicycles for different trip purposes (City of Bakersfield 2002). Bicycle facilities within the city are classed as follows:

- Bike Path (Class 1): A bike path is a completely separated right-of-way for the exclusive use of bicycles and pedestrians, and minimizes cross flow.
- Bike Lane (Class 2): A bike lane is a striped lane for one-way bike travel on a street or highway.
- Bike Route (Class 3): A bike route is shared with pedestrians or motor vehicle traffic.

Kern County developed and adopted a Bikeway Master Plan in the mid-1970s following the petroleum energy crisis (City of Bakersfield and Kern County 2006). The plan called for bicycle lanes on various streets and exclusive bike paths on canals, along railroad rights-of-way, and along the Kern River. In 1984, Kern Council of Governments sponsored a bikeway study for the metropolitan area that called for more on-street bike lanes and fewer paths along canals and railroad rights-of-way. Over 30 miles (48.3 kilometers) of bike lanes exist along various streets in the city of Bakersfield. Figure 4.4-7 illustrates the bike paths in the vicinity of the proposed Bakersfield station.

C. PEDESTRIAN ACCESS

Several locations in the metropolitan area have high levels of pedestrian activity, including Downtown Bakersfield and school vicinities. The primary components of the pedestrian circulation system are sidewalks and crosswalks. Pedestrian sidewalks are present on Truxtun Avenue, Union Avenue and California Avenue in the vicinity of the proposed station location. In older neighborhoods with no sidewalks, pedestrians must walk in the street, and many older neighborhoods lack wheelchair access.

The project site is currently composed mostly of agricultural fields, with some single-family residential and office buildings, as well as light industrial. The project site currently lacks destination areas that are conducive to walking trips.

D. MAJOR PEDESTRIAN AND BICYCLE TRAFFIC GENERATORS

To determine and organize existing pedestrian and bicycle generators within 0.5 mile (0.8 kilometer) of the proposed Bakersfield HST station, five categories of activity centers were defined:

- Recreational/cultural/parks
- Major employers
- Retail shopping
- Educational institutions (e.g., high schools, colleges and universities)
- Travel accommodations (e.g., hotels and airports)

The activity centers within 0.5 mile (0.8 kilometer) of the proposed Bakersfield HST stations are listed in Table 4.4-4.

Table 4.4-4
Activity Centers within 0.5 Mile (0.8 Kilometer) of the Proposed Bakersfield HST Station

Pedestrian/Bicycle Traffic Generator	Location	Activity Center Category
Downtown Bakersfield	Generally bounded by SR 58, SR 178, and SR 99	• Major employment center • 180 retail stores • 60 restaurants

Note: All pedestrian and bicycle traffic generators listed above are in the Downtown Bakersfield area.
HST high-speed train
SR State Route

4.4.9 Parking Facilities

There are four parking lots located in the vicinity of the proposed station area. All four parking lots are located approximately 0.5 mile, or less, from the proposed station locations.

4.4.10 Freight and Goods Movement

Freight and goods movement is accomplished in the area through truck cartage and rail freight services. The following paragraphs describe both services and their use.

A. TRUCK ROUTES

There are multiple truck routes near the proposed Bakersfield station. The designated truck routes are listed below (City of Bakersfield 2010b).

- California Avenue, between Real Road and Oak Street
- California Avenue, between Oak Street and A Street
- California Avenue, between N Street and P Street
- California Avenue, between P Street and Union Avenue
- California Avenue, between Union Avenue and Beale Avenue
- California Avenue, between Martin Luther King Jr. Boulevard and Mt. Vernon Avenue
- Brundage Lane, between Chester Avenue and Oak Street
- Union Avenue, between Brundage Lane and Fourth Street
- Union Avenue, between Fourth Street and California Avenue
- Union Avenue, between California Avenue and Hayden Court
- Union Avenue, between Hayden Court and Twenty-first Street
- Union Avenue, between Twenty-first Street and Espee Street
- Mt. Vernon Avenue, between Brundage Lane and California Avenue
- Chester Avenue, between Thirtieth Street and Thirty-fourth Street

B. FREIGHT RAIL AND TRAIN MOVEMENTS

Within the city of Bakersfield, the Union Pacific Railroad and BNSF Railway provide freight service.

Chapter 5
Impacts and Mitigation

5.0 Impacts and Mitigation

5.1 Trip Generation and Trip Distribution

Daily and peak-hour traffic from the proposed project was estimated based on the modeling performed by Cambridge Systematics, using factors such as regional and local population forecasts, employment, and trip generation and distribution. The daily forecasted trips at each of the stations were used to determine how many station-related trips would occur during the peak hour. Table 5.1-1 summarizes the projected trip generation for the stations.

Table 5.1-1
Trip Generation for the Stations

Station	Daily Trips	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
Fresno	4,370	70:30	456	196	652	30:70	196	456	652
Kings/Tulare	1,730	70:30	181	77	258	30:70	77	181	258
Bakersfield	4,590	70:30	479	205	684	30:70	205	479	684
Note: Trip generation is based on forecast developed by Cambridge Systematics (2007).									

The forecasted daily trips at each of the stations were distributed on the transportation network based on the results of the regional travel demand models and access to and from the proposed station areas. Trip generation assumed that 15% of the total daily trips would occur during the peak hour. Figures 5.1-1 through 5.1-3 illustrate the trip distribution percentage for the proposed project. Figures 5.1-4 through 5.1-6 illustrate the peak-hour project-only turning movements at the study intersections.

5.2 Existing plus Project Conditions

Level-of-service analysis was conducted at the study intersections and roadway segments for Existing plus Project Conditions to evaluate the impacts at the roadway segments and study intersections due to the addition of traffic from the proposed project.

The study areas for the analysis were defined at each of the three station area locations in consultation with representatives at the public works and transportation planning agencies for Kern, Kings, and Tulare counties, the cities of Fresno and Bakersfield, and the California Department of Transportation (District 6, Fresno). The boundaries of each of the station study areas were individually defined based on the potential for impacts on roadway segments and at intersections from the addition of new traffic. The roads and intersections are shown on the figures included in this section. Between stations, the HST corridor would cross most local roadways on grade-separated or elevated tracks that would allow for continued passage and avoid or minimize traffic impacts. Traffic impacts at the locations where the HST is proposed to be at-grade have been analyzed and documented in this report.

5.2.1 Fresno Station Study Area

Two station locations were studied in the Fresno area. The Fresno Station–Mariposa Alternative is located in Downtown Fresno, less than 0.5 mile east of SR 99 on the BNSF Alternative. The Fresno Station–Kern Alternative is similarly situated in Downtown Fresno and would be located on the BNSF Alternative, centered on Kern Street between Tulare Street and Inyo Street

(Figure 2-3). This station would include the same components as the Fresno Station–Mariposa Alternative, but under this alternative, the station would not encroach on the historic Southern Pacific Railroad depot just north of Tulare Street and would not require relocation of existing Greyhound facilities. Because there is no discernable difference in transportation impacts between the Fresno Station–Kern and the Fresno Station–Mariposa sites, these two sites are considered together as the "Fresno Station study area."

A. FRESNO STATION STUDY AREA ROADWAY SEGMENTS

Figure 5.2-1 illustrates the projected average daily traffic along the roadway segments for Existing plus Project. Table 5.2-1 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus Project Conditions. As illustrated in Table 5.2-1, one of the roadway segments projected to operate at LOS E or F under Existing Conditions is projected to continue to operate at LOS E or F. None of the roadway segments are projected to be substantially impacted by the project.

Table 5.2-1
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided / Un-divided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
1	Fulton St., between SR 180 Eastbound Ramps and E. Divisadero St.	0/2	One-Way	6,970	7,120	D	D
2	Van Ness Ave., between SR 180 Eastbound Ramps and E. Divisadero St.	2/0	One-Way	5,204	5,984	C	C
3	E. Divisadero St., between H St. and Broadway St.	2/2	Undivided	9,014	9,014	C	C
4	H St., between E. Divisadero St. and Stanislaus St.	1/1	Undivided	4,120	4,380	C	C
5	Broadway St., between San Joaquin St. and Stanislaus St.	1/2	Undivided	1,916	1,916	C	C
6	Van Ness Ave., between Stanislaus St. and E. Divisadero St.	1/1	Undivided/ Divided	5,262	6,202	D or C	D
7	Stanislaus St., between Van Ness Ave. and O St.	0/3	One-Way	4,360	4,700	C	C
8	N. Blackstone Ave., between McKenzie Ave. and E. Belmont Ave.	0/3	One-Way	8,074	8,414	C	C
9	N. Abby St., between McKenzie Ave. and E. Belmont Ave.	3/0	One-Way	9,036	9,396	C	C
10	E. Belmont Ave., between N. Fresno St. and N. Abby St.	2/2	Divided	12,080	12,080	C	C
11	Stanislaus St., between Broadway St. and E St.	0/2 before F St and 0/3 after F St	One-Way	6,996	7,016	D or C	D or C

Table 5.2-1
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided / Un-divided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
12	Tuolumne St., between Broadway St. and E St.	2/0 before F St and 3/0 after F St	One-Way	5,586	5,596	C	C
13	Tuolumne St., between Van Ness Ave. and O St.	3/0	One-Way	4,300	4,300	C	C
14	Fresno St., between P St. and M St.	2/2	Divided	12,322	13,132	D	D
15	Fresno St., between M St. and Van Ness Ave.	2/2	Divided	12,150	12,980	C	D
16	Fresno St., between Van Ness Ave. and Broadway St.	2/2	Divided	13,250	14,390	D	D
17	Fresno St., between G St. and SR 99 Northbound Ramps	2/2	Divided	16,082	18,112	D	D
18	Fresno St., between C St. and B St.	2/2	Divided	11,860	11,990	C	C
19	Van Ness Ave., between Fresno St. and Tulare St.	2/1	Undivided	9,992	10,982	D	D
20	Tulare St., between Broadway St. and Van Ness Ave.	2/2	Divided	7,174	8,604	C	C
21	Tulare St., between R St. and U St.	2/2	Undivided	19,910	20,710	D	D
22	Divisadero St., between N. Fresno St. and SR 41 Ramps	2/2	Divided/ Undivided	20,338	23,038	D	D
23	Tulare St., between SR 41 Ramps and N. 1st St.	2/2	Divided/ Undivided	32,476	32,636	F	F
24	M St., between Tulare St. and Inyo St.	0/3	One-Way	4,000	4,050	C	C
25	Inyo St., between Broadway St. and Van Ness Ave.	1/1	Undivided	3,302	4,652	C	C
26	Van Ness Ave., between Inyo St. and Ventura Ave.	1/1	Undivided	7,586	8,506	D	D
27	P St., between Inyo St. and Ventura Ave.	2/0	One-Way	2,018	2,038	C	C
28	Ventura Ave., between B St. and C St.	2/2	Divided	13,886	14,016	D	D
29	Ventura Ave., between E St. and G St.	2/2	Undivided	14,320	14,450	D	D

Table 5.2-1
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided / Un-divided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
30	Broadway St., between Ventura Ave. and SR 41 Ramps	1/2 before Santa Clara St. 1/3 after Santa Clara St.	Undivided	3,438	3,438	C	C
31	Van Ness Ave., between Ventura Ave. and SR 41 Ramps	1/1	Undivided	9,346	10,166	D	D
32	Ventura Ave., between M St. and Van Ness Ave.	2/2	Divided	11,838	11,938	C	C
33	Ventura Ave., between P St. and N. 1st St.	2/2	Undivided	11,500	11,630	D	D
34	N. Blackstone Ave., between SR 180 Eastbound Ramps and E. Belmont Ave.	0/3	One-Way	12,774	13,114	D	D
35	N. Abby St., between SR 180 Eastbound Ramps and E. Belmont Ave.	3/0	One-Way	12,906	13,266	D	D
36	Divisadero St., between G St. and H St.	2/1	Undivided	7231	-	C	-
37	Kern St., between G St. and H St.	1/1	Undivided	1416	-	C	-
38	Mono St., between G St. and H St.	1/1	Undivided	510	-	C	-
39	S. Railroad Ave., between E. Florence Ave. and E. Church Ave.	1/1	Undivided	2,931	-	C	-
40	S. Railroad Ave., between E. Church Ave. and E. Jensen Ave.	1/1	Undivided	2,094	-	C	-
41	S. Orange Ave., between S. Railroad Ave. and S. Golden State Blvd.	1/1	Undivided	956	-	C	-

Data collected by URS in 2010.

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002). Levels of Service defined in Table 3.1-1.

ADT average daily traffic
LOS level of service
SR State Route

B. FRESNO STATION STUDY AREA INTERSECTIONS

Figures 5.2-2a through 5.2-2f illustrate the peak-hour turning movements at the study intersections under Existing plus Project Conditions. Table 5.2-2 summarizes the results of the level-of-service analysis for the study area intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). Figures 5.2-3a and 5.2-3b illustrate the projected level of service at the study intersections in Fresno. As illustrated in Table 5.2-2, six study intersections are projected to operate at LOS E or F under Existing Conditions. The following study intersections are projected to be substantially affected by the proposed project.

- SR 99 northbound ramps/Ventura Avenue
- Divisadero Street/SR 41 northbound ramps/Tulare Street
- H Street/Divisadero Street
- N. Blackstone Avenue/SR 180 westbound ramps

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Broadway St./SR 41 Northbound Ramp/Monterey St.	Two-Way Stop	8.9	A	8.9	A		10.3	B	10.3	B	
2	Van Ness Ave./SR 41 Northbound Ramp	All-Way Stop	10.2	B	11.8	B		10.1	B	10.9	B	
3	Broadway St./SR 41 Southbound Ramp	One-Way Stop	9.3	A	9.3	A		10.8	B	10.8	B	
4	Van Ness Ave./SR 41 Southbound Ramp	One-Way Stop	24.5	C	32.2	D		13.3	B	13.7	B	
5	SR 99 Southbound Ramps/Ventura Ave.	Signalized	10.5	B	10.4	B		7.2	A	7.1	A	
6	SR 99 Northbound Ramps/Ventura Ave.	One-Way Stop	137.2	F	142.9	F	5.7	34.5	D	35.5	E	
7	E St./Ventura Ave.	Two-Way Stop	32.1	D	33.0	D		35.7	E	37.1	E	1.4
8	G St./Ventura Ave.	Signalized	9.6	A	9.6	A		10.5	B	10.6	B	
9	Broadway St./Ventura Ave.	Signalized	14.7	B	14.7	B		20.7	C	20.7	C	
10	Van Ness Ave./Ventura St.	Signalized	18.6	B	19.5	B		16.2	B	17.1	B	
11	M St./Ventura Ave.	Signalized	9.2	A	9.2	A		10.4	B	10.5	B	
12	O St./Ventura Ave.	Signalized	27.3	C	27.4	C		21.6	C	21.6	C	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
13	P St./Ventura Ave.	Signalized	6.1	A	6.1	A		4.9	A	4.9	A	
14	N. 1st St./Ventura Ave.	Signalized	13.6	B	13.5	B		16.5	B	16.5	B	
15	G St./Inyo St.	One-Way Stop	9.9	A	9.9	A		10.0	B	10.1	B	
16	H St./Inyo St.	Signalized	9.6	A	12.4	B		7.8	A	9.4	A	
17	Van Ness Ave./Inyo St.	Signalized	7.1	A	9.0	A		8.1	A	8.2	A	
18	M St./Inyo St.	Signalized	6.5	A	6.5	A		8.2	A	8.2	A	
19	P St./Inyo St.	Two-Way Stop	10.7	B	10.8	B		11.1	B	11.1	B	
20	G St./Kern St.	Signalized	4.6	A	4.3	A		5.1	A	4.8	A	
21	H St./Kern St.	One-Way Stop	13.2	B	13.3	B		11.6	B	11.6	B	
22	E St./Tulare St.	Signalized	7.5	A	7.5	A		7.7	A	7.7	A	
23	F St./Tulare St.	Signalized	5.7	A	5.7	A		7.5	A	7.5	A	
24	G St./Tulare St.	Signalized	7.9	A	8.0	B		11.4	B	12.4	B	
25	H St./Tulare St.	Signalized	11.1	B	11.6	B		10.5	B	11.1	B	
26	Van Ness Ave./Tulare St.	Signalized	20.4	C	22.0	C		18.5	B	21.8	C	
27	M St./Tulare St.	Signalized	9.8	A	9.9	A		10.5	B	10.5	B	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
28	P St./Tulare St.	Signalized	6.4	A	6.6	A		6.2	A	6.4	A	
29	R St./Tulare St.	Signalized	12.0	B	12.6	B		11.8	B	12.1	B	
30	U St./Tulare St.	Signalized	6.1	A	6.3	A		13.3	B	13.9	B	
31	Divisadero St. Off-Ramp/Tulare St.	Signalized	7.1	A	7.2	A		11.7	B	12.6	B	
32	SR 41 Southbound Ramp/Divisadero St.	Signalized	20.3	C	21.0	C		9.8	A	10.2	B	
33	SR 41 Northbound Ramps/Tulare St.	Signalized	10.0	B	10.2	B		12.3	B	12.8	B	
33-0	Divisadero St./SR 41 Northbound Ramps/Tulare St.	Signalized	140.9	F	148.4	F	7.5	375.5	F	394.8	F	19.3
34	N. 1st St./Tulare St.	Signalized	34.0	C	34.1	C		35.9	D	35.9	D	
35	H St./Mariposa St./Fresno Ramps	Signalized	9.4	A	9.1	A		8.3	A	8.3	A	
36	C St./Fresno St.	Signalized	8.1	A	7.8	A		13.4	B	13.4	B	
37	SR 99 Southbound Ramps/Fresno St.	Signalized	18.2	B	22.5	C		23.7	C	39.8	D	
38	SR 99 Northbound Ramps/Fresno St.	Signalized	16.2	B	17.9	B		22.5	C	24.0	C	
39	G St./Fresno St.	Signalized	7.2	A	7.6	A		7.0	A	8.0	A	
40	H St./Fresno St.	Not used										

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
41	Broadway St./Fresno St.	Signalized	5.0	A	5.1	A		6.9	A	9.5	A	
42	Van Ness Ave./Fresno St.	Signalized	23.6	C	26.9	C		25.4	C	29.6	C	
43	M St./Fresno St.	Signalized	9.6	A	9.7	A		9.4	A	9.4	A	
44	P St./Fresno St.	Signalized	9.6	A	9.6	A		9.8	A	9.9	A	
45	Fresno St./R St.	Signalized	11.1	B	11.1	B		11.8	B	11.8	B	
46	Fresno St./Divisadero St.	Signalized	22.7	C	22.9	C		23.1	C	23.6	C	
47	H St./Broadway St.	Signalized	6.7	A	9.4	A		8.9	A	9.1	A	
48	E St./Tuolumne St.	Signalized	8.9	A	8.9	A		10.2	B	10.2	B	
49	Broadway St./Tuolumne St.	Signalized	10.1	B	10.1	B		11.0	B	11.0	B	
50	Van Ness Ave./Tuolumne St.	Signalized	11.2	B	11.2	B		12.7	B	14.5	B	
51	O St./Tuolumne St.	Signalized	4.1	A	4.1	A		4.3	A	4.3	A	
52	E St./Stanislaus St.	Signalized	6.2	A	6.2	A		8.5	A	8.5	A	
53	Broadway St./Stanislaus St.	Signalized	9.3	A	9.3	A		8.6	A	8.6	A	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
54	Van Ness Ave./Stanislaus St.	Signalized	10.5	B	10.9	B		11.9	B	12.7	B	
55	N. Blackstone Ave./Stanislaus St.	Signalized	19.9	B	23.2	C		15.3	B	15.4	B	
56	N. Abby St./E. Divisadero St.	Signalized	10.9	B	10.9	B		13.5	B	13.9	B	
57	N. Blackstone Ave./Divisadero St.	Signalized	13.8	B	15.2	B		10.5	B	10.6	B	
58	H St./San Joaquin St.	One-Way Stop	12.8	B	13.2	B		12.4	B	12.7	B	
59	M St./Divisadero St.	Signalized	7.6	A	7.6	A		6.4	A	6.4	A	
60	H St./Amador St.	One-Way Stop	14.6	B	15.6	C		12.3	B	12.9	B	
61	G St./Divisadero St.	Signalized	8.1	A	5.3	A		8.7	A	5.8	A	
62	N. Roosevelt Ave./E. Divisadero Ave.	One-Way Stop	13.8	B	-	-		16.5	C	-	-	
63	H St./Divisadero St.	Signalized	74.7	E	236.9	F	162.2	33.7	C	34.6	C	
64	Broadway St./Divisadero St.	Signalized	5.7	A	5.8	A		7.7	A	7.8	A	
65	Fulton St./Divisadero St.	Signalized	11.9	B	11.9	B		10.6	B	10.6	B	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
66	Van Ness Ave./Divisadero St.	Signalized	8.7	A	12.0	B		13.2	B	14.5	B	
67	H St./Roosevelt St.	Signalized	13.9	B	3.1	A		13.5	B	4.1	A	
68	N. Blackstone Ave./E. McKenzie Ave.	Signalized	5.7	A	5.7	A		6.8	A	6.8	A	
69	N. Abby St./E. McKenzie Ave.	Signalized	6.8	A	6.7	A		7.5	A	7.6	A	
70	Fulton St./SR 180 Eastbound Ramps	Signalized	11.3	B	12.1	B		8.7	A	8.8	A	
71	Van Ness Ave./SR 180 Eastbound Ramps	Signalized	7.4	A	7.5	A		10.8	B	11.4	B	
72	Fulton St./SR 180 Westbound Ramps	Signalized	18.0	B	17.9	B		9.8	A	9.8	A	
73	Van Ness Ave./SR 180 Westbound Ramps	Signalized	8.7	A	8.8	A		10.6	B	10.7	B	
74	N. Blackstone Ave./E Belmont Ave.	Signalized	17.5	B	18.0	B		15.0	B	15.2	B	
75	N. Abby St./E. Belmont St.	Signalized	13.5	B	13.5	B		16.4	B	16.7	B	
76	Fresno St./E. Belmont St.	Signalized	23.9	C	24.4	C		29.9	C	30.3	C	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
77	N. 1st St./E. Belmont St.	Signalized	22.0	C	22.1	C		27.1	C	27.3	C	
78	N. Blackstone Ave./SR 180 Eastbound Ramps	Signalized	8.5	A	8.7	A		5.9	A	5.9	A	
79	N. Abby St./SR 180 Eastbound Ramps	Signalized	9.0	A	9.0	A		11.0	B	11.2	B	
80	N. Blackstone Ave./SR 180 Westbound Ramps	Signalized	171.1	F	207.8	F	36.7	17.4	B	18.2	B	
81	Broadway St./Amador St.	Two-Way Stop	10.2	B	10.3	B		10.9	B	11.1	B	
82	Broadway St./San Joaquin St.	Two-Way Stop	9.8	A	9.8	A		11.0	B	11.0	B	
83	F St./Fresno St.	Signalized	4.8	A	4.8	A		5.2	A	5.2	A	
84	G St./Mono St.	Two-Way Stop	10.2	B	9.2	A		11.0	B	9.4	A	
85	H St./Mono St.	Two-Way Stop	11.0	B	11.0	B		11.9	B	11.9	B	
86	H St./Ventura St.	Two-Way Stop	34.7	D	34.5	D		28.6	D	28.9	D	
87	O St./Santa Clara St./SR 41 SB Off-Ramp	Four-Way Stop	11.5	B	11.5	B		11.1	B	11.1	B	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
88	M St./SR 41 SB On-Ramp	- Not Used										
89	M St./San Benito St./SR 41 NB On-Ramp	Two-Way Stop	11.7	B	11.7	B		218.0	F	218.0	F	
90	Broadway St./Santa Clara St.	Two-Way Stop	14.2	B	15.8	B		10.4	B	11.2	B	
91	Van Ness Ave./E. Hamilton Ave.	All Way Stop	9	A	9.0	A		8.7	A	8.7	A	
92	S. Van Ness Ave./E. California Ave.	Two-Way Stop	10.8	B	13.7	B		11.6	B	16.6	C	
93	S. Railroad Ave./E. Lorena Ave.	One-Way Stop	0.3	A				9.6	A			
94	S. Van Ness Ave./S. Railroad Ave.	One-Way Stop	10.7	B				11	B			
95	S. Railroad Ave./E. Florence Ave.	Two-Way Stop	11	B				11.5	B			
96	S. Golden State Blvd./E. Church Ave.	Signalized	14.1	B	15.3	B		13.3	B	15.9	B	
97	S. Railroad Ave./E. Church Ave.	Signalized	5.4	A				5.8	A			
98	S. East Ave./E. Church Ave.	One-Way Stop	11.4	B	12.6	B		12.8	B	15.4	C	

Table 5.2-2
Existing plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
99	S. Sunland Ave./E. Church Ave.	Two-Way Stop	14.4	B	14.5	B		16.3	C	16.6	C	
100	S. East Ave./S. Railroad Ave.	One-Way Stop	10.7	B				11.1	B			
101	S. East Ave./S. Golden State Blvd.	Signalized	17.2	B	10.9	B		24.9	C	23.3	C	
102	S. Golden State Blvd./E. Jensen Ave.	Signalized	14.9	B	14.7	B		14.8	B	15.5	B	
103	S. Railroad Ave./S. Orange Ave.	One-Way Stop	9.1	A				7.3	A			
104	S. Golden State Blvd./ S. Orange Ave.	Two-Way Stop	11.7	B	10.8	B		13.8	B	12.5	B	

* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

5.2.2 Kings/Tulare Regional Station Study Area

A. KINGS/TULARE REGIONAL STATION STUDY AREA ROADWAY SEGMENTS

Figure 5.2-4 illustrates the projected average daily traffic along the roadway segments for Existing plus Project Conditions (i.e., after the project is built). Table 5.2-3 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus Project Conditions. As Table 5.2-3 shows, seven of the roadway segments projected to operate at LOS E or F under Existing Conditions are projected to continue to operate at LOS E or F. The following roadway segment is projected to be substantially affected by the proposed project.

- SR 198 between 7th Avenue and 6th Avenue
- SR 198 between 6th Avenue and 2nd Avenue
- SR 198 between 2nd Avenue and Road 48

B. KINGS/TULARE REGIONAL STATION STUDY AREA INTERSECTIONS

Figure 5.2-5 illustrates the peak-hour turning movements at the study intersections under Existing plus Project Conditions. Table 5.2-4 summarizes the results of the level-of-service analysis for the study intersections. Figure 5.2-6 illustrates the projected level of service at the study intersections.

As illustrated in Table 5.2-4, three study intersections projected to operate at LOS E or F under Existing Conditions are projected to continue to operate at LOS E or F. The SR 43/Lacey Boulevard intersection is projected to operate at LOS E or F under Existing plus Project Conditions. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output).

Four of the study intersections are projected to be substantially affected by the addition of the traffic from the proposed project. Those intersections are:

- Seventh Street/SR 198
- Sixth Street/SR 198
- Second Avenue/SR 198
- SR 43/Lacey Boulevard

Table 5.2-3
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
1	SR 198, between 11th Ave. and 10th Ave.	2/2	Divided	13,138	13,138	D	D
2	SR 198, between 10th Ave. and 9th Ave.	2/2	Divided	20,380	21,310	D	D
3	SR 198, between 9th Ave. and 8th Ave./SR 43	2/2	Divided	21,050	22,010	D	D

Table 5.2-3
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
4	8th Ave./SR 43, between Grangeville Blvd. and SR 198 Ramps	1/1	Undivided	9,364	11,474	D	D
5	8th Ave./SR 43, between SR 198 Ramps and Hanford Armona Rd.	1/1	Undivided	9,780	10,040	D	D
6	SR 198, between SR 198 Ramps and 7th Ave.	1/2 followed by 1/1	Divided/ Undivided	19,060	19,450	D or F	D/F
7	SR 198, between 7th Ave. and 6th Ave.	1/1	Undivided	19,500	20,310	F	F
8	SR 198, between 6th Ave. and 2nd Ave.	1/1	Undivided	18,194	18,954	F	F
9	SR 198, between 2nd Ave. and Road 48	1/1	Undivided	18,574	19,274	F	F
10	SR 198, between Road 48 and Road 56/17th Ave.	1/1	Undivided	19,458	19,458	F	F
11	SR 198, between Road 56/17th Ave. and County Road 60	1/1	Undivided	18,738	18,738	F	F
12	SR 198, between County Road 60 and County Road J25/Road 68	1/1	Undivided	18,884	18,884	F	F
13	SR 198, between County Road J25/Road 68 and SR 99 Ramps	2/2	Divided	19,032	19,032	D	D

Data collected by URS in 2010.

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002). Levels of Service defined in Table 3.1-1.

* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

Acronyms:
LOS level of service
SR State Route

Table 5.2-4
Existing plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	9th Ave./SR 198	Two-Way Stop	13.4	B	13.6	B		13.0	B	13.2	B	
2	8th Ave./SR 198 Westbound Ramps	One-Way Stop	12.7	B	14.8	B		13.9	B	15.5	C	
3	8th Ave./SR 198 Westbound Ramps	One-Way Stop	13.1	B	17.7	C		13.6	B	15.5	C	
4	7th St./SR 198	Two-Way Stop	239.0	F	496.3	F	257.3	141.0	F	211.9	F	70.9
5	7th St./7th Rd.	One-Way Stop	Not used									
6	6th St./SR 198	Two-Way Stop	51.3	F	71.6	F	20.3	72.8	F	85.8	F	13.0
7	2nd Ave./SR 198	Two-Way Stop	29.6	D	44.4	E	14.8	55.8	F	78.8	F	23.0
8	SR 43/Lacey Blvd.	One-Way Stop	32.1	D	166.1	F	134.0	27.4	D	479.6	F	452.2
9	SR 43/Grangeville Blvd.	Signalized	24.1	C	24.5	C		18.0	B	18.3	B	

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.

Note: Delay time is reported in seconds.

Acronyms:
Int. = intersection
LOS = level of service
SR = state route

5.2.3 Bakersfield Station Study Area

Two station locations were studied in Bakersfield:

- Bakersfield Station–North Alternative
- Bakersfield Station–South Alternative

A. BAKERSFIELD STATION STUDY AREA ROADWAY SEGMENTS

Figures 5.2-7a and 5.2-7b illustrate the projected average daily traffic along the roadway segments for Existing plus Project Conditions. Table 5.2-5 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus Project Conditions. As illustrated in Table 5.2-5, four of the roadway segments projected to operate at LOS E or F under Existing Conditions are projected to continue to operate at LOS E or F. No additional roadway segments are projected to operate at LOS E or F with the addition of the traffic from the proposed project.

None of the roadway segments are projected to be substantially affected by the proposed project.

B. BAKERSFIELD STATION STUDY AREA INTERSECTIONS

Figures 5.2-8a through 5.2-8e illustrate the peak-hour turning movements at the study intersections under Existing plus Project Conditions (North and South alternatives). Table 5.2-6 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output).

As illustrated in Table 5.2-6, nine study intersections that are projected to operate at LOS E or F under Existing Conditions are projected to continue to operate at LOS E or F under Existing plus Project Conditions (North and South alternatives). The following additional intersection is projected to operate at LOS E or F under Existing plus Project Conditions (South Alternative):

- Union Avenue/Hayden Court

Three of the study intersections in the Bakersfield Station–North Alternative and four of the study intersections in the Bakersfield Station–South Alternative are projected to be substantially affected by the proposed project. Those intersections are:

- S. Union Avenue/eastbound SR 58 ramps (North and South alternatives)
- SR 99 ramps/California Avenue (North and South alternatives)
- Union Avenue/Hayden Court (South Alternative)
- Union Avenue/Golden State Avenue/Twenty-first Street (North and South alternatives)

Figures 5.2-9a and 5.2-9b illustrate the projected level of service at the study intersections in the city of Bakersfield.

Table 5.2-5
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)	Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)
1	California Ave., between Real Rd. and Oak St.	2/3	Divided	39,594	*	41,694	C	*	D
2	California Ave., between Oak St. and A St.	2/3	Divided	23,646	*	25,856	A	*	A
3	California Ave., between N St. and P St.	3/3	Divided	17,130	*	19,580	A	*	A
4	California Ave., between P St. and Union Ave.	3/3	Divided	15,250	*	17,800	A	*	A
5	California Ave., between Union Ave. and Beale Ave.	3/3	Divided	18,142	*	18,512	A	*	A
6	California Ave., between Martin Luther King Jr. Blvd. and Mt. Vernon Ave.	3/3 and 2/2	Divided	11,734	*	12,114	A	*	A
7	P St., between 8th St. and California Ave.	1/1	Undivided	5,280	*	5,330	A	*	A
8	Q St., between California Ave. and 14th St.	2/2	Undivided	8,146	*	8,146	A	*	A
9	Chester Ave., between 24th St. and 30th St.	2/2	Divided	17,164	*	17,174	A	*	A
10	Brundage Ln., between Chester Ave. and Oak St.	2/2	Undivided	13,182	*	13,212	A	*	A
11	Union Ave., between Brundage Ln. and 4th St.	3/3	Divided	31,544	*	33,514	A	*	A

Table 5.2-5
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)	Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)
12	Union Ave., between 4th St. and California Ave.	3/3	Divided	30,506	*	32,476	A	*	A
13	Union Ave., between California Ave. and Hayden Ct.t	3/3	Divided	31,286	31,886	31,896	A	A	A
14	Union Ave., between Hayden Ct. and 21st St.	3/3	Divided	29,760	31,020	31,700	A	A	A
15	Union Ave., between 21st St. and Espee St.	3/3	Divided	22,460	*	23,050	A	*	A
16	SR 178, between Oak St. and Buck Owens Blvd./SR 99 Northbound Ramps	3/3	Divided	54,384	*	54,544	E	*	E
17	SR 178, between 23rd St. and Chester Ave.	0/3	One-Way	28,878	*	28,878	E	*	E
18	Beale Ave., between Truxtun Ave. and Monterey St.	2/2	Divided	13,398	*	13,858	A	*	A
19	Beale Ave., between Niles St. and Flower St.	2/2	Divided	11,184	*	11,644	A	*	A
20	Beale Ave., between Truxtun Ave. and California Ave.	1/1	Undivided	1,700	*	1,700	A	*	A
21	Mt. Vernon Ave., between Brundage Ln. and California Ave.	2/2	Divided	21,498	*	21,658	A	*	A
22	Truxtun Ave., between Oak St. and F St.	2/2	Divided	21,804	*	22,234	A	*	A

Table 5.2-5
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)	Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)
23	Truxtun Ave., between Oak St. and Bahamas Dr.	2/2	Divided	38,822	*	39,092	E	*	E
24	Truxtun Ave., between Q St. and Beale Ave.	3/3	Divided	12,584	*	13,074	A	*	A
25	Chester Ave., between 30th St. and 34th St.	2/2	Divided	24,030	*	24,170	A	*	A
26	F St., between Golden State Ave. and 30th St.	2/2	Undivided	15,408	*	15,468	A	*	A
27	F St., between 30th St. and 24th St.	2/2	Undivided	13,268	*	13,328	A	*	A
28	F St., between 24th St. and 23rd St.	2/2	Divided	17,034	*	17,094	A	*	A
29	F St., between 23rd St. and 21st St.	2/2	Undivided	12,058	*	12,118	A	*	A
30	F St., between 21st St. and Truxtun Ave.	2/2	Undivided	8,394	*	8,394	A	*	A
31	23rd St., between 24th St. and F St.	2/0 and 3/0	One-Way	25,772	*	25,772	F/D	*	F/D
32	23rd St., between F St. and Chester Ave.	3/0	One-Way	26,362	*	26,362	D	*	D
33	Oak St., between SR 178 and Truxtun Ave.	2/2	Undivided	23,914	*	24,074	C	*	C
34	Truxtun Ave., between F St. and Chester Ave.	2/2	Divided	20,432	*	20,862	A	*	A

Table 5.2-5
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)	Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)
35	Truxtun Ave., between Chester Ave. and Q St.	3/3	Divided	14,218	*	14,548	A	*	A
36	California Ave., between A St. and Chester Ave.	2/3 and 3/3	Divided	22,042	*	24,282	A	*	A
37	Chester Ave., between California Ave. and 4th St.	2/2	Undivided	15,118	*	15,128	A	*	A
38	Chester Ave., between 4th St. and Brundage Ln.	2/2	Undivided	15,660	*	15,710	A	*	A
39	California Ave., between S. King St. and S. Owens St.	3/3	Divided	13,894	*	14,264	A	*	A
40	California Ave., between S. Owens St. and Mt. Vernon Ave.	3/3	Divided	11,754	*	12,134	A	*	A
41	Monterey St., between Beale Ave. and Williams St.	3/0	One-Way	6,524	*	6,524	A	*	A
42	Niles St., between Beale Ave. and Williams St.	0/3 and 2/2	Divided	6,776	*	6,776	A	*	
43	Q St., between 23rd St. and 19th St.	1/1	Undivided	7,292	*	7,292	A	*	A
44	Q St., between 19th St. and Truxtun Ave.	1/1	Undivided	8,192	*	8,192	A	*	A

Table 5.2-5
Roadway Segments Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)	Existing (No Project)	Existing plus Project (North)	Existing plus Project (South)
45	Chester Ave., between 23rd St. and Truxtun Ave.	2/2	Divided	18,550	*	18,560	A	*	A
46	Chester Ave., between Truxtun Ave. and California Ave.	2/2	Divided	17,898	*	17,968	A	*	A

Source: Data collected by URS in 2010.

*Same as South Alternative

Note:
LOS is based on volume-to-capacity ratios.

Acronyms:
ADT Average Daily Traffic
LOS level of service
SR State Route

Table 5.2-6
Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay*	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay2
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	S. Union Ave./Eastbound SR 58 Ramps	Signalized	204.0	F	236.0	F	32.0	12.5	B	14.4	B	
2	Mt. Vernon Ave./Eastbound SR 58 Ramps	Signalized	19.8	B	20.1	C		19.4	B	19.8	B	
3	Wible Rd./Oak St./Brundage Ln./Stockdale Hwy.	Signalized	20.2	C	20.3	C		33.1	C	33.3	C	
4	Chester Ave./Brundage Ln.	Signalized	21.6	C	21.6	C		24.6	C	24.6	C	
5	P St./Brundage Ln.	Signalized	10.8	B	10.9	B		12.8	B	12.8	B	
6	S. Union Ave./E. Brundage Ln.	Signalized	33.7	C	37.7	D		35.8	D	40.2	D	
7	Liggett St. and E. Brundage Ln.	Signalized	19.8	B	21.0	C		19.8	B	20.2	C	
8	Mt. Vernon Ave./E. Brundage Ln.	Signalized	23.7	C	23.8	C		26.9	C	26.4	C	
9	Chester Ave./4th St.	Signalized	11.8	B	11.9	B		11.9	B	11.9	B	
10	P St./4th St.	Signalized	5.5	A	5.5	A		6.0	A	6.0	A	
11	Union Ave./4th St.	Signalized	10.6	B	11.1	B		12.6	B	13.0	B	
12	Chester Ave./8th St.	Signalized	8.5	A	8.4	A		9.3	A	9.2	A	
13	P St./8th St.	All-Way Stop	9.9	A	10.1	B		11.8	B	12.1	B	
14	Real Rd./California Ave.	Signalized	48.2	D	51.1	D		60.7	E	61.4	E	0.7
15	SR 99 Ramps/California Ave.	Signalized	73.8	E	90.5	F	16.7	22.9	C	25.7	C	

Table 5.2-6
Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay*	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay2
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
16	Oak St./California Ave.	Signalized	75.2	E	76.2	E	1.0	63.5	E	67.1	E	3.6
17	A St./California Ave.	Signalized	23.5	C	24.5	C		14.1	B	14.1	B	
18	Oleander Ave./California Ave.	Signalized	9.2	A	9.1	A		5.7	A	5.5	A	
19	H St./California Ave.	Signalized	26.5	C	27.3	C		30.4	C	32.6	C	
20	Chester Ave./California Ave.	Signalized	29.0	C	33.6	C		33.0	C	35.3	D	
21	N St./California Ave.	Signalized	5.6	A	5.5	A		6.4	A	6.3	A	
22	P St./California Ave.	Signalized	17.2	B	17.7	B		19.8	B	21.1	C	
23	Union Ave./California Ave.	Signalized	32.2	C	35.8	D		37.3	D	41.1	D	
24	King St./California Ave.	Signalized	16.4	B	16.4	B		12.8	B	12.7	B	
25	Owens St./California Ave.	Signalized	10.4	B	10.4	B		14.0	B	14.2	B	
26	Martin Luther King Jr. Blvd./Haley St./California Ave.	Signalized	13.7	B	13.4	B		9.2	A	9.2	A	
27	Mt. Vernon Ave./California Ave.	Signalized	22.8	C	23.2	C		45.8	D	47.9	D	
28	Q St./14th St.	Signalized	2.8	A	2.8	A		4.1	A	4.1	A	
29	Union Ave./Hayden Ct.	Signalized	19.2	B	65.5	E	46.3	18.9	B	30.6	C	
30	Oak St./Truxtun Ave.	Signalized	111.9	F	114.4	F	2.5	72.0	E	73.6	E	1.6
31	F St./Truxtun Ave.	Signalized	15.6	B	15.8	B		27.7	C	28.3	C	

Table 5.2-6
Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay*	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay2
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
32	H St./Truxtun Ave.	Signalized	28.8	C	29.0	C		26.5	C	26.8	C	
33	Chester Ave./Truxtun Ave.	Signalized	30.1	C	30.6	C		28.0	C	28.5	C	
34	L St./Truxtun Ave.	Signalized	37.6	D	38.2	D		29.9	C	30.8	C	
35	N St./Truxtun Ave.	Signalized	14.4	B	14.4	B		12.3	B	12.4	B	
36	Q St./Truxtun Ave.	Signalized	19.7	B	19.8	B		22.3	C	22.4	C	
37	E. Truxtun Ave./Beale Ave./E. 19th St.	Signalized	17.4	B	17.4	B		13.7	B	14.2	B	
38	Q St./19th St.	Signalized	6.6	A	6.6	A		8.3	A	8.3	A	
39	F St./21st St.	Signalized	7.8	A	7.8	A		9.4	A	9.4	A	
40	Q St./21st St.	Signalized	9.4	A	9.4	A		8.3	A	8.4	A	
41	Union Ave./Golden State Ave./21st St.	Signalized	25.8	C	27.6	C		89.4	F	113.9	F	24.5
42	F St./23rd St.	Signalized	45.6	D	45.9	D		44.7	D	45.1	D	
43	Chester Ave./23rd St.	Signalized	61.3	E	61.3	E	0.0	90.7	F	92.2	F	1.5
44	Q St./23rd St.	Two-Way Stop	12.4	B	12.4	B		14.1	B	14.1	B	
45	SR 178/SR 99 Southbound Ramps	Signalized	7.7	A	7.7	A		12.3	B	12.5	B	
46	SR 178/SR 99 Ramps/Buck Owens Blvd.	Signalized	31.0	C	31.2	C		58.8	E	60.3	E	1.5
47	Oak St./SR 178	Signalized	84.6	F	84.9	F	0.3	72.3	E	73.1	E	0.8

Table 5.2-6
Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay*	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay2
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
48	F St./24th St.	Signalized	45.0	D	45.9	D	0.9	31.8	C	31.8	C	
49	Chester Ave./24th St.	Signalized	60.4	E	61.3	E	0.9	59.0	E	60.0	E	1.0
50	Beale Ave./Monterey St.	Signalized	10.3	B	10.4	B		11.6	B	11.8	B	
51	Q St./Golden State Ave.	Signalized	18.8	B	18.9	B		20.8	C	20.9	C	
52	Union Ave./Espee St.	Signalized	14.0	B	14.1	B		16.7	B	16.9	B	
53	Beale Ave./Niles St.	Signalized	12.8	B	13.0	B		11.2	B	11.4	B	
54	William St./Niles St.	Two-Way Stop	10.7	B	10.7	B		10.4	B	10.4	B	
55	Mt. Vernon Ave./Niles St.	Signalized	24.5	C	24.6	C		28.6	C	28.9	C	
56	M St./28th St./Golden State Ave.	Signalized	14.4	B	14.5	B		28.6	C	28.7	C	
57	Union Ave./W. Niles St.	Signalized	11.9	B	12.1	B		12.4	B	12.5	B	
58	F St./30th St.	Signalized	12.6	B	12.6	B		17.4	B	17.5	B	
59	Beale Ave./Flower St.	Signalized	21.1	C	21.0	C		22.5	C	22.0	C	
60	F St./Golden State Ave.	Signalized	24.5	C	25.0	C		45.8	D	46.7	D	
61	Beale Ave./Jefferson St.	One-Way Stop	13.5	B	14.2	B		16.0	C	16.7	C	
62	Chester Ave./34th St.	Signalized	18.6	B	18.6	B		24.4	C	24.5	C	
63	Union Ave./34th St./Bernard St.	Signalized	53.6	D	53.7	D		31.2	C	31.3	C	

Table 5.2-6
Existing plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay*	Existing No Project		Existing plus Project Conditions (South Alternative)		Increase in Delay2
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
64	Chester Ave./W. Columbus St.	Signalized	6.6	A	6.6	A		9.9	A	10.4	B	
65	Union Ave./Columbus St.	Signalized	30.2	C	30.4	C		30.5	C	30.5	C	
66	Chester Ave./30th St./SR 99 Ramps and 30th St.	Round-about										
67	L St./California St.	Signalized	2.9	A	2.9	A		3.2	A	3.4	A	

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

Note: Delay time is reported in seconds.

The tabulated results are the same for both the Bakersfield Station–North and –South aalternatives except for Intersection#29. The Delay/LOS for this Intersection in North Alternative for AM and PM are 37.9/D and 23.1/C, respectively.

Acronyms:
Int. = intersection
LOS = level of services

5.3 Future No-Build (Year 2035) Conditions

Level-of-service analysis at the study intersections and roadway segments was conducted for Future No-Build (Year 2035) Conditions to establish a base to evaluate the impacts due to the addition of traffic from the proposed project. Future No-Build traffic demands were projected based on the Counties of Fresno, Kings, and Kern Travel Demand Regional Models. The regional travel demand models included the future transportation improvements that are funded and included in the Regional Transportation Improvement Plans (RTIPs) (RTIP projects are listed in Sections 4.2.5, 4.3.5, and 4.4.5 of this document). Intersection and roadway segment analysis for Future No-Build and Project Conditions was conducted taking into account the transportation improvements included in the RTIPs. Peak-hour turning-movement volumes at the study intersections were projected by application of the Furness procedure using the TurnsW32 software. The assumed improvements at the study intersections are provided in Appendix C (Future Assumed Improvements).

Figures 5.3-1 through 5.3-3 illustrate the daily traffic along the study roadway segments within the cities of Fresno, Hanford, and Bakersfield. Figures 5.3-4 through 5.3-6 illustrate the projected peak-hour turning movements at the study intersections within the cities of Fresno, Hanford, and Bakersfield.

5.3.1 Fresno Station Study Area

A. FRESNO STATION STUDY AREA ROADWAY SEGMENTS

Table 5.3-1 summarizes the results of the level-of-service analysis for the roadway segments. As illustrated in Table 5.3-1, nine of the roadway segments are projected to operate at LOS E or F under Future No-Build (Year 2035) Conditions. These are:

- E. Divisadero Street, between H Street and Broadway Street
- H Street, between E. Divisadero Street and Stanislaus Street
- E. Belmont Avenue, between N. Fresno Street and N. Abby Street
- Stanislaus Street, between Broadway Street, and E Street
- Fresno Street, between C Street and B Street
- Tulare Street, between SR 41 ramps and N. First Street
- Ventura Avenue, between B Street and C Street
- N. Blackstone Avenue, between SR 180 EB ramps and E. Belmont Avenue
- N. Abby Street, between SR 180 eastbound ramps and E. Belmont Avenue

B. FRESNO STATION STUDY AREA INTERSECTIONS

Table 5.3-2 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix E (No-Build Synchro Output). As illustrated in Table 5.3-2, 54 of the 104 study intersections are projected to operate at LOS E or F. The intersections projected to operate at LOS E or F during one or both peak hours are:

- Van Ness Avenue/SR 41 northbound ramp
- Broadway Street/SR 41 southbound ramp
- Van Ness Avenue/SR 41 southbound ramp
- SR 99 southbound ramps/Ventura Avenue
- SR 99 northbound ramps/Ventura Avenue
- E Street/Ventura Avenue
- Broadway Street/Ventura Avenue
- Van Ness Avenue/Ventura Street
- O Street/Ventura Avenue

- P Street/Inyo Street
- H Street/Kern Street
- E Street/Tulare Street
- F Street/Tulare Street
- G Street/Tulare Street
- Van Ness Avenue/Tulare Street
- U Street/Tulare Street
- N. First Street/Tulare Street
- C Street/Fresno Street
- SR 99 southbound ramps/Fresno Street
- SR 99 northbound ramps/Fresno Street
- Van Ness Avenue/Fresno Street
- Fresno Street/R Street
- Fresno Street/Divisadero Street
- H Street/Amador Street
- G Street/Divisadero Street
- N. Roosevelt Avenue/E. Divisadero Avenue
- H Street/Divisadero Street
- Broadway Street/Divisadero Street
- Van Ness Avenue/Divisadero Street
- H Street/Roosevelt Street
- N. Blackstone Avenue/E. McKenzie Avenue
- Van Ness Avenue/SR 180 eastbound ramps
- Fulton Street/SR 180 westbound ramps
- Van Ness Avenue/SR 180 westbound ramps
- N. Blackstone Avenue/E. Belmont Avenue
- N. Abby Street/E. Belmont Street
- Fresno Street/E. Belmont Street
- N. First Street/E. Belmont Street
- N. Abby Street/SR 180 eastbound ramps
- N. Blackstone Avenue/SR 180 westbound ramps
- Broadway Street/Amador Street
- Broadway Street/San Joaquin Street
- F Street/Fresno Street
- G Street/Mono Street
- H Street/Ventura Street
- O Street/Santa Clara Street/SR 41 southbound off-ramp
- M Street/San Benito Street/SR 41 northbound on-ramp
- S. Van Ness Avenue/E. California Avenue
- S. Golden State Boulevard/E. Church Avenue
- S. East Avenue/E. Church Avenue
- S. Sunland Avenue/E. Church Avenue
- S. East Avenue/S. Railroad Avenue
- S. Golden State Boulevard/E. Jensen Avenue
- S. Golden State Boulevard/S. Orange Avenue

Table 5.3-1
Roadway Segments No-Build Daily Traffic Volumes and LOS: Fresno Station

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Future No-Build Conditions	
				ADT	LOS
1	Fulton St., between SR 180 Eastbound Ramps and E. Divisadero St.	0/2	One-Way	8,230	D
2	Van Ness Ave., between SR 180 Eastbound Ramps and E. Divisadero St.	2/0	One-Way	13,670	D
3	E. Divisadero St., between H St. and Broadway St.	2/2	Undivided	32,610	F
4	H St., between E. Divisadero St. and Stanislaus St.	1/1	Undivided	16,150	F
5	Broadway St., between San Joaquin St. and Stanislaus St.	1/2	Undivided	12,730	D
6	Van Ness Ave., between Stanislaus St. and E. Divisadero St.	1/1	Undivided/ Divided	8,280	D
7	Stanislaus St., between Van Ness Ave. and O St.	0/3	One-Way	17,440	D
8	N. Blackstone Ave., between McKenzie Ave. and E. Belmont Ave.	0/3	One-Way	21,360	D
9	N. Abby St., between McKenzie Ave. and E. Belmont Ave.	3/0	One-Way	16,980	D
10	E. Belmont Ave., between N. Fresno St. and N. Abby St.	2/2	Divided	34,810	F
11	Stanislaus St., between Broadway St. and E St.	0/2	One-Way	24,100	F
12	Tuolumne St., between Broadway St. and E St.	2/0	One-Way	13,060	D
13	Tuolumne St., between Van Ness Ave. and O St.	3/0	One-Way	8,530	C
14	Fresno St., between P St. and M St.	2/2	Divided	29,000	D
15	Fresno St., between M St. and Van Ness Ave.	2/2	Divided	22,500	D
16	Fresno St., between Van Ness Ave. and Broadway St.	2/2	Divided	25,700	D
17	Fresno St., between G St. and SR 99 Northbound Ramps	2/2	Divided	27,890	D
18	Fresno St., between C St. and B St.	2/2	Divided	34,380	F
19	Van Ness Ave., between Fresno St. and Tulare St.	2/1	Undivided	14,970	D
20	Tulare St., between Broadway St. and Van Ness Ave.	2/2	Divided	30,210	D
21	Tulare St., between R St. and U St.	2/2	Undivided	22,310	D
22	Divisadero St., between N. Fresno St. and SR 41 Ramps	2/2	Divided/ Undivided	27,160	D

Table 5.3-1
Roadway Segments No-Build Daily Traffic Volumes and LOS: Fresno Station

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Future No-Build Conditions	
				ADT	LOS
23	Tulare St., between SR 41 Ramps and N. 1st St.	2/2	Divided/ Undivided	34,630	F
24	M St., between Tulare St. and Inyo St.	0/3	One-Way	17,230	D
25	Inyo St., between Broadway St. and Van Ness Ave.	1/1	Undivided	9,790	D
26	Van Ness Ave., between Inyo St. and Ventura Ave.	2/2	Undivided	13,120	D
27	P St., between Inyo St. and Ventura Ave.	3/0	One-Way	8,800	C
28	Ventura Ave., between B St. and C St.	2/2	Divided	30,390	E
29	Ventura Ave., between E St. and G St.	2/2	Divided	24,450	D
30	Broadway St., between Ventura Ave. and SR 41 Ramps	1/2	Undivided	19,480	D
31	Van Ness Ave., between Ventura Ave. and SR 41 Ramps	2/1	Undivided	19,420	D
32	Ventura Ave., between M St. and Van Ness Ave.	2/2	Divided	21,310	D
33	Ventura Ave., between P St. and N. 1st St.	3/3	Undivided	35,260	D
34	N. Blackstone Ave., between SR 180 Eastbound Ramps and E. Belmont Ave.	0/3	One-Way	26,250	F
35	N. Abby St., between SR 180 Eastbound Ramps and E. Belmont Ave.	3/0	One-Way	23,480	E
36	Divisadero St., between G St. and H St.	2/1	Undivided	19,777	D
37	Kern St., between G St. and H St.	1/1	Undivided	2,278	C
38	Mono St., between G St. and H St.	1/1	Undivided	820	C
39	S. Railroad Ave., between E. Florence Ave. and E. Church Ave.	1/1	Undivided	3,084	C
40	S. Railroad Ave., between E. Church Ave. and E. Jensen Ave.	1/1	Undivided	2,339	C
41	S. Orange Ave., between S. Railroad Ave. and S. Golden State Blvd.	1/1	Undivided	2,308	C

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
ADT average daily traffic
LOS level of service
SR State Route

Table 5.3-2
No-Build Peak-Hour Intersection Level of Service: Fresno Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1	Broadway St./SR 41 Northbound Ramp/Monterey St.	Two-Way Stop	10.2	B	13.0	B
2	Van Ness Ave./SR 41 Northbound Ramp	All-Way Stop	45.8	E	19.3	C
3	Broadway St./SR 41 Southbound Ramp	One-Way Stop	27.7	D	43.5	E
4	Van Ness Ave./SR 41 Southbound Ramp	One-Way Stop	6801.6	F	6794.9	F
5	SR 99 Southbound Ramps/Ventura Ave.	Signalized	29.3	C	128.2	F
6	SR 99 Northbound Ramps/Ventura Ave.	One-Way Stop	2873.9	F	*	F
7	E St./Ventura Ave.	Two-Way Stop	*	F	*	F
8	G St./Ventura Ave.	Signalized	8.5	A	14.6	B
9	Broadway St./Ventura Ave.	Signalized	75.7	E	110.9	F
10	Van Ness Ave./Ventura St.	Signalized	22.2	C	83.6	F
11	M St./Ventura Ave.	Signalized	10.8	B	21.1	C
12	O St./Ventura Ave.	Signalized	24.7	C	60.5	E
13	P St./Ventura Ave.	Signalized	4.7	A	8.8	A
14	N. 1st St./Ventura Ave.	Signalized	15.2	B	45.7	D
15	G St./Inyo St.	One-Way Stop	10.7	B	18.9	C
16	H St./Inyo St.	Signalized	19.0	B	15.5	B
17	Van Ness Ave./Inyo St.	Signalized	10.4	B	15.3	B
18	M St./Inyo St.	Signalized	9.5	A	19.7	B
19	P St./Inyo St.	Two-Way Stop	16.0	C	55.4	F
20	G St./Kern St.	Signalized	5.0	A	13.3	B
21	H St./Kern St.	One-Way Stop	25.9	D	35.8	E
22	E St./Tulare St.	Signalized	21.7	C	301.1	F
23	F St./Tulare St.	Signalized	10.7	B	145.9	F
24	G St./Tulare St.	Signalized	27.1	C	266.8	F
25	H St./Tulare St.	Signalized	12.0	B	45.7	D
26	Van Ness Ave./Tulare St.	Signalized	25.4	C	142.3	F
27	M St./Tulare St.	Signalized	10.6	B	33.0	C
28	P St./Tulare St.	Signalized	10.3	B	29.7	C
29	R St./Tulare St.	Signalized	11.1	B	23.6	C

Table 5.3-2
No-Build Peak-Hour Intersection Level of Service: Fresno Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
30	U St./Tulare St.	Signalized	8.7	A	79.8	E
31	Divisadero St. Off-Ramp/Tulare St.	Signalized	7.0	A	11.6	B
32	SR 41 Southbound Ramp/Divisadero St.	Signalized	15.4	B	23.0	C
33	SR 41 Northbound Ramps/Tulare St.	Signalized	9.7	A	17.4	B
33-0	Divisadero St./SR 41 Northbound Ramps/Tulare St.	Signalized	24.6	C	40.8	D
34	N. 1st St./Tulare St.	Signalized	46.5	D	59.5	E
35	H St./Mariposa St./Fresno Ramps	Signalized	11.3	B	10.8	B
36	C St./Fresno St.	Signalized	11.5	B	96.9	F
37	SR 99 Southbound Ramps/Fresno St.	Signalized	56.4	E	137.7	F
38	SR 99 Northbound Ramps/Fresno St.	Signalized	43.6	D	154.2	F
39	G St./Fresno St.	Signalized	8.0	A	15.8	B
40	H St./Fresno St.	Not Used				
41	Broadway St./Fresno St.	Signalized	4.8	A	12.7	B
42	Van Ness Ave./Fresno St.	Signalized	29.1	C	70.1	E
43	M St./Fresno St.	Signalized	13.1	B	44.5	D
44	P St./Fresno St.	Signalized	11.7	B	18.9	B
45	Fresno St./R St.	Signalized	23.8	C	128.7	F
46	Fresno St./Divisadero St.	Signalized	28.7	C	127.1	F
47	H St./Broadway St.	Signalized	6.3	A	12.7	B
48	E St./Tuolumne St.	Signalized	12.9	B	11.3	B
49	Broadway St./Tuolumne St.	Signalized	12.7	B	19.8	B
50	Van Ness Ave./Tuolumne St.	Signalized	11.7	B	16.7	B
51	O St./Tuolumne St.	Signalized	3.5	A	6.6	A
52	E St./Stanislaus St.	Signalized	7.8	A	14.2	B
53	Broadway St./Stanislaus St.	Signalized	12.1	B	16.7	B
54	Van Ness Ave./Stanislaus St.	Signalized	12.6	B	23.9	C
55	N. Blackstone Ave./Stanislaus St.	Signalized	28.2	C	41.1	D
56	N. Abby St./E. Divisadero St.	Signalized	11.5	B	29.1	C
57	N. Blackstone Ave./Divisadero St.	Signalized	18.7	B	31.3	C
58	H St./San Joaquin St.	One-Way Stop	17.5	C	26.3	D
59	M St./Divisadero St.	Signalized	11.1	B	16.4	B
60	H St./Amador St.	One-Way Stop	21.5	C	215.7	F

Table 5.3-2
No-Build Peak-Hour Intersection Level of Service: Fresno Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
61	G St./Divisadero St.	Signalized	23.1	C	183.7	F
62	N. Roosevelt Ave./E. Divisadero Ave.	One-Way Stop	308.1	F	*	F
63	H St./Divisadero St.	Signalized	156.2	F	196.3	F
64	Broadway St./Divisadero St.	Signalized	16.7	B	57.3	E
65	Fulton St./Divisadero St.	Signalized	15.2	B	16.4	B
66	Van Ness Ave./Divisadero St.	Signalized	24.0	C	85.6	F
67	H St./Roosevelt St.	Signalized	19.3	B	116.1	F
68	N. Blackstone Ave./E. McKenzie Ave.	Signalized	10.5	B	84.9	F
69	N. Abby St./E. McKenzie Ave.	Signalized	10.3	B	10.5	B
70	Fulton St./SR 180 Eastbound Ramps	Signalized	30.5	C	22.7	C
71	Van Ness Ave./SR 180 Eastbound Ramps	Signalized	33.4	C	127.4	F
72	Fulton St./SR 180 Westbound Ramps	Signalized	48.4	D	119.3	F
73	Van Ness Ave./SR 180 Westbound Ramps	Signalized	39.3	D	96.7	F
74	N. Blackstone Ave./E Belmont Ave.	Signalized	96.1	F	196.0	F
75	N. Abby St./E. Belmont St.	Signalized	46.5	D	96.5	F
76	Fresno St./E. Belmont St.	Signalized	46.2	D	199.4	F
77	N. 1st St./E. Belmont St.	Signalized	43.6	D	126.4	F
78	N. Blackstone Ave./SR 180 Eastbound Ramps	Signalized	8.9	A	9.8	A
79	N. Abby St./SR 180 Eastbound Ramps	Signalized	43.4	D	86.2	F
80	N. Blackstone Ave./SR 180 Westbound Ramps	Signalized	197.6	F	354.5	F
81	Broadway St./Amador St.	Two-Way Stop	18.6	C	*	F
82	Broadway St./San Joaquin St.	Two-Way Stop	28.9	D	*	F
83	F St./Fresno St.	Signalized	6.0	A	87.7	F
84	G St./Mono St.	Two-Way Stop	10.5	B	38.2	E
85	H St./Mono St.	Two-Way Stop	12.2	B	14.2	B
86	H St./Ventura St.	Two-Way Stop	46.0	E	*	F
87	O St./Santa Clara St./SR 41 SB Off-Ramp	Four-Way Stop	15.0	C	69.3	F

Table 5.3-2
No-Build Peak-Hour Intersection Level of Service: Fresno Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
88	M St./SR 41 SB On-Ramp	Not Used				
89	M St./San Benito St./SR 41 NB On-Ramp	Two-Way Stop	17.7	C	*	F
90	Broadway St./Santa Clara St.	Two-Way Stop	14.8	B	16.9	C
91	Van Ness Ave./E. Hamilton Ave.	All Way Stop	9.3	A	12.8	B
92	S. Van Ness Ave./E. California Ave.	Two-Way Stop	63.1	F	*	F
93	S. Railroad Ave./E. Lorena Ave.	One-Way Stop	0.2	A	10.4	B
94	S. Van Ness Ave./S. Railroad Ave.	One-Way Stop	10.6	B	28.6	D
95	S. Railroad Ave./E. Florence Ave.	Two-Way Stop	10.6	B	20.1	C
96	S. Golden State Blvd./E. Church Ave.	Signalized	41.8	D	185.5	F
97	S. Railroad Ave./E. Church Ave.	Signalized	6.1	A	35.8	D
98	S. East Ave./E. Church Ave.	One-Way Stop	260	F	*	F
99	S. Sunland Ave./E. Church Ave.	Two-Way Stop	56.8	F	16.3	C
100	S. East Ave./S. Railroad Ave.	One-Way Stop	11.5	B	36.7	E
101	S. East Ave./S. Golden State Blvd.	Signalized	38.8	D	19.4	B
102	S. Golden State Blvd./E. Jensen Ave.	Signalized	160.5	F	358.2	F
103	S. Railroad Ave./S. Orange Ave.	One-Way Stop	10.7	B	29.4	D
104	S. Golden State Blvd./S. Orange Ave.	Two-Way Stop	66.4	F	*	F

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Note: Delay time is reported in seconds.
Acronyms:
Int. = intersection
LOS = level of services

5.3.2 Kings/Tulare Regional Station Study Area

A. KINGS/TULARE REGIONAL STATION STUDY AREA ROADWAY SEGMENTS

Table 5.3-3 summarizes the results of the level-of-service analysis for the roadway segments. As illustrated in Table 5.3-3, two roadway segments are projected to operate at LOS E or F. The

roadway segments projected to operate at LOS E or F under Future No-Build (2035) Conditions are:

- SR 198, between Eleventh Avenue and Tenth Avenue
- Eighth Avenue/SR 43, between SR 198 ramps and Hanford Armona Road

Table 5.3-3
Roadway Segments No-Build Daily Traffic Volumes and LOS: Kings/Tulare Regional Station

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Future No-Build Conditions	
				ADT	LOS
1	SR 198, between 11th Ave. and 10th Ave.	2/2	Divided	46,672	F
2	SR 198, between 10th Ave. and 9th Ave.	2/2	Divided	28,700	D
3	SR 198, between 9th Ave. and 8th Ave./SR 43	2/2	Divided	23,150	D
4	8th Ave./SR 43, between Grangeville Blvd. and SR 198 Ramps	1/1	Undivided	12,850	D
5	8th Ave./SR 43, between SR 198 Ramps and Hanford Armona Rd.	1/1	Undivided	14,080	E
6	SR 198, between SR 198 Ramps and 7th Ave.	2/2	Divided	21,860	D
7	SR 198, between 7th Ave. and 6th Ave.	2/2	Divided	21,180	D
8	SR 198, between 6th Ave. and 2nd Ave.	2/2	Divided	19,320	D
9	SR 198, between 2nd Ave. and Road 48	2/2	Divided	20,240	D
10	SR 198, between Road 48 and Road 56/17th Ave.	2/2	Divided	30,126	D
11	SR 198, between Road 56/17th Ave. and County Road 60	2/2	Divided	30,126	D
12	SR 198, between County Road 60 and County Road J25/Road 68	2/2	Divided	30,126	D
13	SR 198, between County Road J25/Road 68 and SR 99 Ramps	2/2	Divided	30,126	D

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
ADT average daily traffic
LOS level of service
SR State Route

B. KINGS/TULARE REGIONAL STATION STUDY AREA INTERSECTIONS

Table 5.3-4 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix E (No-Build Synchro Output). As illustrated in Table 5.3-4, five of the study intersections are projected to operate at LOS E or F. The intersections projected to operate at LOS E or F during one or both peak hours are:

- Ninth Avenue/SR 198
- Seventh Street/SR 198

- Sixth Street/SR 198
- Second Avenue/SR 198
- SR 43/Lacey Boulevard

Table 5.3-4
No-Build Peak-Hour Intersection Level of Service: Kings/Tulare Regional Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1	9th Ave./SR 198	Two-Way Stop	124.2	F	101.9	F
2	8th Ave./SR 198 Westbound Ramps	One-Way Stop	13.2	B	24.1	C
3	8th Ave./SR 198 Eastbound Ramps	One-Way Stop	20.0	C	27.0	D
4	7th St./SR 198	Two-Way Stop	432.5	F	*	F
5	7th St./7th Rd.	One-Way Stop	Not Used			
6	6th St./SR 198	Two-Way Stop	43.1	E	*	F
7	2nd Ave./SR 198	Two-Way Stop	26.5	D	94.4	F
8	SR 43/Lacey Blvd.	One-Way Stop	36.6	E	52.8	F
9	SR 43/Grangeville Blvd.	Signalized	24.2	C	29.3	C

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Note: Delay time is reported in seconds.
Acronyms:
Int. = intersection
LOS = level of service
SR = State Route

5.3.3 Bakersfield Station Study Area

A. BAKERSFIELD STATION STUDY AREA ROADWAY SEGMENTS

Table 5.3-5 summarizes the results of the level-of-service analysis for the roadway segments in the Bakersfield station study area. As illustrated in Table 5.3-5, four of the roadway segments are projected to operate at LOS E or F. The roadway segments projected to operate at LOS E or F under Future No-Build Conditions are:

- SR 178, between Twenty-third Street and Chester Avenue
- Twenty-third Street, between Twenty-fourth Street and F Street
- Twenty-third Street, between F Street and Chester Avenue
- Oak Street, between SR 178 and Truxtun Avenue

Table 5.3-5
Roadway Segments No-Build Daily Traffic Volumes and Level of Service: Bakersfield Station

No.	Roadway Segment	Number of Lanes	Divided / Undivided	Future No-Build Conditions	
				ADT	LOS
1	California Ave., between Real Rd. and Oak St.	3/3	Divided	41,930	B
2	California Ave., between Oak St. and A St.	3/3	Divided	21,460	A
3	California Ave., between N St. and P St.	3/3	Divided	19,830	A
4	California Ave., between P St. and Union Ave.	3/3	Divided	22,240	A
5	California Ave., between Union Ave. and Beale Ave.	3/3	Divided	22,240	A
6	California Ave., between Martin Luther King Jr. Blvd. and Mt. Vernon Ave.	2/2	Divided	12,210	A
7	P St., between 8th St. and California Ave.	2/2	Undivided	12,250	A
8	Q St., between California Ave. and 14th St.	2/2	Undivided	12,990	A
9	Chester Ave., between 24th St. and 30th St.	2/2	Divided	18,660	A
10	Brundage Ln., between Chester Ave. and Oak St.	2/2	Undivided	13,390	A
11	Union Ave., between Brundage Ln. and 4th St.	3/3	Divided	42,330	B
12	Union Ave., between 4th St. and California Ave.	3/3	Divided	45,530	C
13	Union Ave., between California Ave. and Hayden Ct.t	3/3	Divided	46,810	C
14	Union Ave., between Hayden Ct. and 21st St.	3/3	Divided	52,360	D
15	Union Ave., between 21st St. and Espee St.	3/3	Divided	41,480	B
16	SR 178, between Oak St. and Buck Owens Blvd./SR 99 Northbound Ramps	4/4	Divided	66,350	D
17	SR 178, between 23rd St. and Chester Ave.	0/4	One-Way	39,260	E
18	Beale Ave., between Truxtun Ave. and Monterey St.	2/2	Divided	16,940	A
19	Beale Ave., between Niles St. and Flower St.	2/2	Divided	14,660	A
20	Beale Ave., between Truxtun Ave and California Ave.	1/1	Undivided	1,900	A
21	Mt. Vernon Ave., between Brundage Ln. and California Ave.	2/2	Divided	22,010	A
22	Truxtun Ave., between Oak St. and F St.	3/3	Divided	35,570	A

Table 5.3-5
Roadway Segments No-Build Daily Traffic Volumes and Level of Service: Bakersfield Station

No.	Roadway Segment	Number of Lanes	Divided / Undivided	Future No-Build Conditions	
				ADT	LOS
23	Truxtun Ave., between Oak St. and Bahamas Dr.	3/3	Divided	51,290	D
24	Truxtun Ave., between Q St. and Beale Ave.	3/3	Divided	22,560	A
25	Chester Ave., between 30th St. and 34th St.	2/2	Divided	25,180	B
26	F St., between Golden State Ave. and 30th St.	2/2	Undivided	17,820	A
27	F St., between 30th St. and 24th St.	2/2	Undivided	15,280	A
28	F St., between 24th St. and 23rd St.	2/2	Divided	16,120	A
29	F St., between 23rd St. and 21st St.	2/2	Undivided	10,020	A
30	F St., between 21st St. and Truxtun Ave.	2/2	Undivided	8,790	A
31	23rd St., between 24th St. and F St.	4/0	One-Way	36,800	E
32	23rd St., between F St. and Chester Ave.	4/0	One-Way	36,780	E
33	Oak St., between SR 178 and Truxtun Ave.	2/2	Undivided	36,330	F
34	Truxtun Ave., between F St. and Chester Ave.	3/3	Divided	35,560	A
35	Truxtun Ave., between Chester Ave. and Q St.	3/3	Divided	28,800	A
36	California Ave., between A St. and Chester Ave.	3/3	Divided	25,750	A
37	Chester Ave., between California Ave. and 4th St.	2/2	Undivided	16,850	A
38	Chester Ave., between 4th St. and Brundage Ln.	2/2	Undivided	19,450	B
39	California Ave., between S. King St. and S. Owens St.	3/3	Divided	15,050	A
40	California Ave., between S. Owens St. and Mt. Vernon Ave.	3/3 & 2/2	Divided	12,210	A
41	Monterey St., between Beale Ave. and Williams St.	3/0	One-Way	8,050	A
42	Niles St., between Beale Ave. and Williams St.	0/3	One-Way	7,760	A
43	Q St., between 23rd St. and 19th St.	2/2	Undivided	17,650	A
44	Q St., between 19th St. and Truxtun Ave.	2/2	Undivided	16,440	A
45	Chester Ave., between 23rd St. and Truxtun Ave.	2/2	Divided	19,780	A

Table 5.3-5
Roadway Segments No-Build Daily Traffic Volumes and Level of Service: Bakersfield Station

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Future No-Build Conditions	
				ADT	LOS
46	Chester Ave., between Truxtun Ave. and California Ave.	2/2	Divided	18,690	A

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation).
Acronyms:
ADT average daily traffic
LOS level of service
SR State Route

B. BAKERSFIELD STATION STUDY AREA INTERSECTIONS

Table 5.3-6 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix E (No-Build Synchro Output). As illustrated in Table 5.3-6, 23 of the study intersections are projected to operate at LOS E or F. The intersections projected to operate at LOS E or F during one or both peak hours are:

- S. Union Avenue/eastbound SR 58 ramps
- Wible Road/Oak Street/Brundage Lane/Stockdale Highway
- Liggett Street and E. Brundage Lane
- P Street/Eighth Street
- Real Road/California Avenue
- Oak Street/California Avenue
- Union Avenue/California Avenue
- Oak Street/Truxtun Avenue
- H Street/Truxtun Avenue
- Union Avenue/Golden State Avenue/Twenty-first Street
- F Street/Twenty-third Street
- Chester Avenue/Twenty-third Street
- Q Street/Twenty-third Street
- SR 178/SR 99 southbound ramps
- SR 178/SR 99 ramps/Buck Owens Blvd.
- Oak Street/SR 178
- F Street/Twenty-fourth Street
- Chester Avenue/Twenty-fourth Street
- Q Street/Golden State Avenue
- Union Avenue/Espee Street
- M Street/Twenty-eighth Street/Golden State Avenue
- F Street/Golden State Avenue
- Union Avenue/Columbus Street

Table 5.3-6
No-Build Peak-Hour Intersection Level of Service: Bakersfield Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1	S. Union Ave./Eastbound SR 58 Ramps	Signalized	128.3	F	22.8	C
2	Mt. Vernon Ave./Eastbound SR 58 Ramps	Signalized	16.5	B	29.1	C
3	Wible Rd./Oak St./Brundage Ln./Stockdale Hwy.	Signalized	28.2	C	81.6	F
4	Chester Ave./Brundage Ln.	Signalized	22.0	C	27.5	C
5	P St./Brundage Ln.	Signalized	14.8	B	22.2	C
6	S. Union Ave./E. Brundage Ln.	Signalized	36.4	D	53.1	D
7	Liggett St. and E. Brundage Ln.	Signalized	61.7	E	44.3	D
8	Mt. Vernon Ave./E. Brundage Ln.	Signalized	23.8	C	38.1	D
9	Chester Ave./4th St.	Signalized	11.5	B	15.9	B
10	P St./4th St.	Signalized	5.7	A	7.3	A
11	Union Ave./4th St.	Signalized	14.4	B	21.4	C
12	Chester Ave./8th St.	Signalized	7.8	A	9.2	A
13	P St./8th St.	All-Way Stop	17.1	C	135.2	F
14	Real Rd./California Ave.	Signalized	55.8	E	151.1	F
15	SR 99 Ramps/California Ave.	Signalized	27.4	C	46.8	D
16	Oak St./California Ave.	Signalized	35.3	D	63.7	E
17	A St./California Ave.	Signalized	19.3	B	15.1	B
18	Oleander Ave./California Ave.	Signalized	7.9	A	6.4	A
19	H St./California Ave.	Signalized	26.9	C	43.0	D
20	Chester Ave./California Ave.	Signalized	21.3	C	29.3	C
21	N St./California Ave.	Signalized	8.0	A	6.4	A
22	P St./California Ave.	Signalized	23.8	C	38.9	D
23	Union Ave./California Ave.	Signalized	36.1	D	66.6	E
24	King St./California Ave.	Signalized	15.2	B	13.7	B
25	Owens St./California Ave.	Signalized	11.4	B	14.4	B
26	Martin Luther King Jr. Blvd./Haley St./ California Ave.	Signalized	13.2	B	13.1	B
27	Mt. Vernon Ave./California Ave.	Signalized	23.7	C	30.3	C
28	Q St./14th St.	Signalized	2.6	A	7.0	A
29	Union Ave./Hayden Ct.	Signalized	21.4	C	26.6	C
30	Oak St./Truxtun Ave.	Signalized	62.3	E	169.1	F
31	F St./Truxtun Ave.	Signalized	13.4	B	34.5	C
32	H St./Truxtun Ave.	Signalized	24.2	C	63.9	E

Table 5.3-6
No-Build Peak-Hour Intersection Level of Service: Bakersfield Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
33	Chester Ave./Truxtun Ave.	Signalized	24.4	C	35.0	C
34	L St./Truxtun Ave.	Signalized	34.6	C	33.0	C
35	N St./Truxtun Ave.	Signalized	15.2	B	12.4	B
36	Q St./Truxtun Ave.	Signalized	34.2	C	41.9	D
37	E. Truxtun Ave./Beale Ave./E. 19th St.	Signalized	12.0	B	11.8	B
38	Q St./19th St.	Signalized	9.0	A	21.7	C
39	F St./21st St.	Signalized	7.9	A	7.6	A
40	Q St./21st St.	Signalized	9.8	A	18.9	B
41	Union Ave./Golden State Ave./21st St.	Signalized	38.9	D	94.2	F
42	F St./23rd St.	Signalized	138.6	F	173.2	F
43	Chester Ave./23rd St.	Signalized	48.3	D	112.6	F
44	Q St./23rd St.	Two-Way Stop	52.3	F	*	F
45	SR 178/SR 99 Southbound Ramps	Signalized	64.5	E	43.0	D
46	SR 178/SR 99 Ramps/Buck Owens Blvd.	Signalized	107.4	F	198.3	F
47	Oak St./SR 178	Signalized	340.5	F	545.2	F
48	F St./24th St.	Signalized	103.3	F	172.7	F
49	Chester Ave./24th St.	Signalized	56.2	E	152.1	F
50	Beale Ave./Monterey St.	Signalized	13.0	B	12.6	B
51	Q St./Golden State Ave.	Signalized	23.1	C	157.9	F
52	Union Ave./Espee St.	Signalized	13.1	B	69.2	E
53	Beale Ave./Niles St.	Signalized	17.8	B	13.2	B
54	William St./Niles St.	Two-Way Stop	11.0	B	12.0	B
55	Mt. Vernon Ave./Niles St.	Signalized	25.1	C	36.3	D
56	M St./28th St./Golden State Ave.	Signalized	197.1	F	320.7	F
57	Union Ave./W. Niles St.	Signalized	33.3	C	46.8	D
58	F St./30th St.	Signalized	15.8	B	30.4	C
59	Beale Ave./Flower St.	Signalized	21.5	C	27.3	C
60	F St./Golden State Ave.	Signalized	189.5	F	491.4	F
61	Beale Ave./Jefferson St.	One-Way Stop	15.0	B	22.9	C
62	Chester Ave./34th St.	Signalized	14.7	B	31.1	C

Table 5.3-6
No-Build Peak-Hour Intersection Level of Service: Bakersfield Station

Int. ID	Intersection	Control	Future No-Build Conditions			
			AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
63	Union Ave./34th St./Bernard St.	Signalized	53.4	D	51.9	D
64	Chester Ave./W. Columbus St.	Signalized	7.9	A	52.2	D
65	Union Ave./Columbus St.	Signalized	31.4	C	74.4	E
66	Chester Ave./30th St./SR 99 Ramps and 30th St.	Round-about				
67	L St./California St.	Signalized	2.9	A	39.2	D

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Note: Delay time is reported in seconds.
Acronyms:
Int. = intersection
LOS = level of service

Figures 5.3-7 through 5.3-9 illustrate the level of service at the study intersections under Future No-Build (Year 2035) Conditions in the cities of Fresno, Hanford, and Bakersfield.

5.4 Future (Year 2035) with Project Conditions

Level-of-service analysis at the study intersections and roadway segments was conducted for Future (Year 2035) with Project Conditions to evaluate the impacts at the roadway segments and study intersections due to the addition of traffic from the proposed project.

The alternatives have the greatest potential to have long-term impacts on traffic at and near the proposed stations, which will attract and concentrate traffic that is entering or exiting the station parking lots and drop-off areas. The study areas for the analysis were defined at each of the three station area locations in consultation with representatives at the public works and transportation planning agencies for Kern, Kings, and Tulare counties, the cities of Fresno and Bakersfield, and the California Department of Transportation (District 6, Fresno). The boundaries of each of the station study areas were individually defined based on the potential of the addition of new traffic to cause impacts on roadway segments and at intersections. The roads and intersections are shown on the figures included in this section. Between stations, the HST corridor will cross most local roadways on grade-separated or elevated tracks to allow for continued passage and to avoid or minimize traffic impacts. This report analyzes the traffic impacts at the locations where the HST is proposed to be at-grade.

5.4.1 Fresno Station Study Area

A. FRESNO STATION STUDY AREA ROADWAY SEGMENTS

Figure 5.4-1 illustrates the projected average daily traffic along the roadway segments for Future (Year 2035) with Project Conditions. Table 5.4-1 summarizes the results of the level-of-service analysis for the roadway segments under Future (Year 2035) with Project Conditions. As illustrated in Table 5.4-1, nine of the roadway segments projected to operate at LOS E or F under

Future No-Build (Year 2035) Conditions are projected to continue to operate at LOS E or F under Future (Year 2035) with Project Conditions. The following two additional roadway segments are projected to operate at LOS E or F under Future (Year 2035) plus Project Conditions:

- Tulare Street, between Broadway Street and Van Ness Avenue
- Divisadero Street, between N. Fresno Street and SR 41 ramps

The following two roadway segments are projected to be substantially impacted by the project:

- Tulare Street, between Broadway Street and Van Ness Avenue
- Divisadero Street, between N. Fresno Street and SR 41 ramps

B. FRESNO STATION STUDY AREA INTERSECTIONS

Figures 5.4-2a through 5.4-2f illustrate the peak-hour turning movements at the study intersections under Future plus Project Conditions. Table 5.4-2 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-2, 51 intersections are projected to operate at LOS E, or higher, under Future plus Project Conditions compared to 54 intersections under Future No-Build Conditions. Level of service at three study intersections under Future plus Project Conditions is projected to improve compared to Future No-Build Conditions as a result of the proposed closures of Divisadero Street. In addition to these 51 intersections, the intersections of H Street/Tulare Street, S. Golden State Boulevard/E. Church Avenue, and S. East Avenue/S. Golden State Boulevard are projected to operate at LOS E or F with the addition of the traffic from the proposed project. The following 30 study intersections are projected to be substantially impacted by the proposed project:

- Van Ness Avenue/SR 41 northbound ramp
- SR 99 northbound ramps/Ventura Avenue
- E Street/Ventura Avenue
- Van Ness Avenue/Ventura Avenue
- H Street/Kern Street
- G Street/Tulare Street
- H Street/Tulare Street
- Van Ness Avenue/Tulare Street
- U Street/Tulare Street
- SR 99 southbound ramps/Fresno Street
- SR 99 northbound ramps/Fresno Street
- Van Ness Avenue/Fresno Street
- Fresno Street/Divisadero Street
- H Street/Amador Street
- Divisadero Street/N. Echo Street
- Van Ness Avenue/Divisadero Street
- N. Roosevelt Avenue/H Street
- N. Blackstone Avenue/E. McKenzie Avenue
- Van Ness Avenue/SR 180 eastbound ramps
- Van Ness Avenue/SR 180 westbound ramps
- N. Blackstone Avenue/E. Belmont Avenue
- N. Abby Street/SR 180 eastbound ramps
- N. Blackstone Avenue/SR 180 westbound ramps
- Broadway Street/Amador Street
- S. Van Ness Avenue/E. California Avenue
- S. Golden State Boulevard/E. Church Avenue
- S. East Avenue/E. Church Avenue

- S. Sunland Avenue/E. Church Avenue
- S. East Avenue/S. Golden State Boulevard
- S. Golden State Boulevard/E. Jensen Avenue

Table 5.4-1
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
1	Fulton St., between SR 180 Eastbound Ramps and E. Divisadero St.	0/2	One-Way	8,230	8,380	D	D
2	Van Ness Ave., between SR 180 Eastbound Ramps and E. Divisadero St.	2/0	One-Way	13,670	14,450	D	D
3	E. Divisadero St., between H St. and Broadway St.	2/2	Undivided	32,610	32,610	F	F
4	H St., between E. Divisadero St. and Stanislaus St.	1/1	Undivided	16,150	16,410	F	F
5	Broadway St., between San Joaquin St. and Stanislaus St.	1/2	Undivided	12,730	12,730	D	D
6	Van Ness Ave., between Stanislaus St. and E. Divisadero St.	1/1	Undivided/ Divided	8,280	9,220	D	D
7	Stanislaus St., between Van Ness Ave. and O St.	0/3	One-Way	17,440	17,780	D	D
8	N. Blackstone Ave., between McKenzie Ave. and E. Belmont Ave.	0/3	One-Way	21,360	21,700	D	D
9	N. Abby St., between McKenzie Ave. and E. Belmont Ave.	3/0	One-Way	16,980	17,340	D	D
10	E. Belmont Ave., between N. Fresno St. and N. Abby St.	2/2	Divided	34,810	34,810	F	F
11	Stanislaus St., between Broadway St. and E St.	0/2	One-Way	24,100	24,120	F	F
12	Tuolumne St., between Broadway St. and E St.	2/0	One-Way	13,060	13,070	D	D
13	Tuolumne St., between Van Ness Ave. and O St.	3/0	One-Way	8,530	8,530	C	C
14	Fresno St., between P St. and M St.	2/2	Divided	29,000	29,810	D	D
15	Fresno St., between M St. and Van Ness Ave.	2/2	Divided	22,500	23,330	D	D

Table 5.4-1
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
16	Fresno St., between Van Ness Ave. and Broadway St.	2/2	Divided	25,700	26,840	D	D
17	Fresno St., between G St. and SR 99 Northbound Ramps	2/2	Divided	27,890	29,920	D	D
18	Fresno St., between C St. and B St.	2/2	Divided	34,380	34,510	F	F
19	Van Ness Ave., between Fresno St. and Tulare St.	2/1	Undivided	14,970	15,960	D	D
20	Tulare St., between Broadway St. and Van Ness Ave.	2/2	Divided	30,210	31,640	D	F
21	Tulare St., between R St. and U St.	2/2	Undivided	22,310	23,110	D	D
22	Divisadero St., between N. Fresno St. and SR 41 Ramps	2/2	Divided/ Undivided	27,160	29,860	D	D/E
23	Tulare St., between SR 41 Ramps and N. 1st St.	2/2	Divided/ Undivided	34,630	34,790	F	F
24	M St., between Tulare St. and Inyo St.	0/3	One-Way	17,230	17,280	D	D
25	Inyo St., between Broadway St. and Van Ness Ave.	1/1	Undivided	9,790	11,140	D	D
26	Van Ness Ave., between Inyo St. and Ventura Ave.	2/2	Undivided	13,120	14,040	D	D
27	P St., between Inyo St. and Ventura Ave.	3/0	One-Way	8,800	8,820	C	C
28	Ventura Ave., between B St. and C St.	2/2	Divided	30,390	30,520	E	E
29	Ventura Ave., between E St. and G St.	2/2	Divided	24,450	24,580	D	D
30	Broadway St., between Ventura Ave. and SR 41 Ramps	1/2	Undivided	19,480	19,480	D	D
31	Van Ness Ave., between Ventura Ave. and SR 41 Ramps	2/1	Undivided	19,420	20,240	D	D
32	Ventura Ave., between M St. and Van Ness Ave.	2/2	Divided	21,310	21,410	D	D

Table 5.4-1
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Fresno Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
33	Ventura Ave., between P St. and N. 1st St.	3/3	Undivided	35,260	35,390	D	D
34	N. Blackstone Ave., between SR 180 Eastbound Ramps and E. Belmont Ave.	0/3	One-Way	26,250	26,590	F	F
35	N. Abby St., between SR 180 Eastbound Ramps and E. Belmont Ave.	3/0	One-Way	23,480	23,840	E	F
36	Divisadero St., between G St. and H St.	2/1	Undivided	19,777	-	D	-
37	Kern St., between G St. and H St.	1/1	Undivided	2,278	-	C	-
38	Mono St., between G St. and H St.	1/1	Undivided	820	-	C	-
39	S. Railroad Ave., between E. Florence Ave. and E. Church Ave.	1/1	Undivided	3,084	-	C	-
40	S. Railroad Ave., between E. Church Ave. and E. Jensen Ave.	1/1	Undivided	2,339	-	C	-
41	S. Orange Ave., between S. Railroad Ave. and S. Golden State Blvd.	1/1	Undivided	2,308	-	C	-

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.
Acronyms:
ADT average daily traffic
LOS level of service
SR State Route

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
1	Broadway St./SR 41 Northbound Ramp/Monterey St.	Two-Way Stop	10.2	B	10.2	B		13.0	B	13.0	B	
2	Van Ness Ave./SR 41 Northbound Ramp	All-Way Stop	45.8	E	71.3	F	25.5	19.3	C	21.2	C	
3	Broadway St./SR 41 Southbound Ramp	One-Way Stop	27.7	D	27.7	D		43.5	E	43.5	E	0.0
4	Van Ness Ave./SR 41 Southbound Ramp	One-Way Stop	6801.6	F	6801.9	F	0.3	6794.9	F	6795.1	F	0.2
5	SR 99 Southbound Ramps/Ventura Ave.	Signalized	29.3	C	30.5	C		128.2	F	128.7	F	0.5
6	SR 99 Northbound Ramps/Ventura Ave.	One-Way Stop	2873.9	F	2893.6	F	19.7	*	F	*	F	*
7	E St./Ventura Ave.	Two-Way Stop	*	F	*	F	*	*	F	*	F	*
8	G St./Ventura Ave.	Signalized	8.5	A	8.5	A		14.6	B	14.9	B	
9	Broadway St./Ventura Ave.	Signalized	75.7	E	75.1	E	-0.6	110.9	F	110.9	F	0.0
10	Van Ness Ave./Ventura St.	Signalized	22.2	C	22.8	C		83.6	F	89.1	F	5.5
11	M St./Ventura Ave.	Signalized	10.8	B	10.8	B		21.1	C	21.3	C	

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project		Future plus Project Conditions		Increase in Delay	No Project		Future plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
12	O St./Ventura Ave.	Signalized	24.7	C	24.8	C		60.5	E	61.8	E	1.3
13	P St./Ventura Ave.	Signalized	4.7	A	4.7	A		8.8	A	8.9	A	
14	N. 1st St./Ventura Ave.	Signalized	15.2	B	15.2	B		45.7	D	45.8	D	
15	G St./Inyo St.	One-Way Stop	10.7	B	10.8	B		18.9	C	18.9	C	
16	H St./Inyo St.	Signalized	19.0	B	25.6	C		15.5	B	19.4	B	
17	Van Ness Ave./Inyo St.	Signalized	10.4	B	10.6	B		15.3	B	16.9	B	
18	M St./Inyo St.	Signalized	9.5	A	9.5	A		19.7	B	19.8	B	
19	P St./Inyo St.	Two-Way Stop	16.0	C	16.0	C		55.4	F	55.6	F	0.2
20	G St./Kern St.	Signalized	5.0	A	4.4	A		13.3	B	7.3	A	
21	H St./Kern St.	One-Way Stop	25.9	D	29.1	D		35.8	E	42.6	E	6.8
22	E St./Tulare St.	Signalized	21.7	C	21.6	C		301.1	F	301.8	F	0.7
23	F St./Tulare St.	Signalized	10.7	B	10.7	B		145.9	F	145.9	F	0.0

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
24	G St./Tulare St.	Signalized	27.1	C	26.7	C		266.8	F	285.8	F	19.0
25	H St./Tulare St.	Signalized	12.0	B	16.0	B		45.7	D	69.1	E	23.4
26	Van Ness Ave./Tulare St.	Signalized	25.4	C	27.7	C		142.3	F	158.3	F	16.0
27	M St./Tulare St.	Signalized	10.6	B	10.7	B		33.0	C	37.0	D	
28	P St./Tulare St.	Signalized	10.3	B	10.8	B		29.7	C	31.0	C	
29	R St./Tulare St.	Signalized	11.1	B	11.4	B		23.6	C	24.9	C	
30	U St./Tulare St.	Signalized	8.7	A	8.9	A		79.8	E	84.7	F	4.9
31	Divisadero St. Off-Ramp/Tulare St.	Signalized	7.0	A	7.1	A		11.6	B	11.9	B	
32	SR 41 Southbound Ramp/Divisadero St.	Signalized	15.4	B	15.5	B		23.0	C	24.4	C	
33	SR 41 Northbound Ramps/Tulare St.	Signalized	9.7	A	9.8	A		17.4	B	17.7	B	
33-0	Divisadero St./SR 41 Northbound Ramps/Tulare St.	Signalized	24.6	C	24.8	C		40.8	D	41.8	D	

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
34	N. 1st St./Tulare St.	Signalized	46.5	D	46.7	D		59.5	E	59.8	E	0.3
35	H St./Mariposa St./Fresno Ramps	Signalized	11.3	B	11.3	B		10.8	B	10.8	B	
36	C St./Fresno St.	Signalized	11.5	B	11.5	B		96.9	F	97.0	F	0.1
37	SR 99 Southbound Ramps/Fresno St.	Signalized	56.4	E	70.3	E	13.9	137.7	F	150.2	F	12.5
38	SR 99 Northbound Ramps/Fresno St.	Signalized	43.6	D	45.3	D		154.2	F	171.7	F	17.5
39	G St./Fresno St.	Signalized	8.0	A	8.4	A		15.8	B	20.3	C	
40	H St./Fresno St.	Not used										
41	Broadway St./Fresno St.	Signalized	4.8	A	5.1	A		12.7	B	21.2	C	
42	Van Ness Ave./Fresno St.	Signalized	29.1	C	33.6	C		70.1	E	92.5	F	22.4
43	M St./Fresno St.	Signalized	13.1	B	13.4	B		44.5	D	51.3	D	
44	P St./Fresno St.	Signalized	11.7	B	11.8	B		18.9	B	22.9	C	
45	Fresno St./R St.	Signalized	23.8	C	24.5	C		128.7	F	129.5	F	0.8

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
46	Fresno St./Divisadero St.	Signalized	28.7	C	29.2	C		127.1	F	131.8	F	4.7
47	H St./Broadway St.	Signalized	6.3	A	8.8	A		12.7	B	13.1	B	
48	E St./Tuolumne St.	Signalized	12.9	B	13.0	B		11.3	B	11.3	B	
49	Broadway St./Tuolumne St.	Signalized	12.7	B	12.7	B		19.8	B	19.8	B	
50	Van Ness Ave./Tuolumne St.	Signalized	11.7	B	12.1	B		16.7	B	22.5	C	
51	O St./Tuolumne St.	Signalized	3.5	A	3.5	A		6.6	A	6.6	A	
52	E St./Stanislaus St.	Signalized	7.8	A	7.8	A		14.2	B	14.2	B	
53	Broadway St./Stanislaus St.	Signalized	12.1	B	12.1	B		16.7	B	16.7	B	
54	Van Ness Ave./Stanislaus St.	Signalized	12.6	B	12.9	B		23.9	C	26.1	C	
55	N. Blackstone Ave./Stanislaus St.	Signalized	28.2	C	23.4	C		41.1	D	45.6	D	
56	N. Abby St./E. Divisadero St.	Signalized	11.5	B	11.5	B		29.1	C	30.9	C	

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project		Future plus Project Conditions		Increase in Delay	No Project		Future plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
57	N. Blackstone Ave./Divisadero St.	Signalized	18.7	B	22.2	C		31.3	C	33.1	C	
58	H St./San Joaquin St.	One-Way Stop	17.5	C	17.9	C		26.3	D	27.1	D	
59	M St./Divisadero St.	Signalized	11.1	B	11.1	B		16.4	B	16.4	B	
60	H St./Amador St.	One-Way Stop	21.5	C	24.5	C		215.7	F	251.3	F	35.6
61	G St./Divisadero St.	Signalized	23.1	C	7.5	A		183.7	F	11.4	B	
62	N. Roosevelt Ave./E. Divisadero Ave.	One-Way Stop	308.1	F	-	-		*	F	-	-	*
63	H St./Divisadero St.	Signalized	156.2	F	388.9	F	232.7	196.3	F	505.4	F	309.1
64	Broadway St./Divisadero St.	Signalized	16.7	B	16.7	B		57.3	E	57.5	E	0.2
65	Fulton St./Divisadero St.	Signalized	15.2	B	15.2	B		16.4	B	16.4	B	
66	Van Ness Ave./Divisadero St.	Signalized	24.0	C	25.1	C		85.6	F	99.5	F	13.9
67	H St./Roosevelt St.	Signalized	19.3	B	51.6	D		116.1	F	162.6	F	46.5
68	N. Blackstone Ave./E. McKenzie Ave.	Signalized	10.5	B	10.8	B		84.9	F	89.8	F	4.9

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
69	N. Abby St./E. McKenzie Ave.	Signalized	10.3	B	10.3	B		10.5	B	10.7	B	
70	Fulton St./SR 180 Eastbound Ramps	Signalized	30.5	C	31.2	C		22.7	C	23.1	C	
71	Van Ness Ave./SR 180 Eastbound Ramps	Signalized	33.4	C	36.1	D		127.4	F	136.8	F	9.4
72	Fulton St./SR 180 Westbound Ramps	Signalized	48.4	D	48.4	D		119.3	F	119.6	F	0.3
73	Van Ness Ave./SR 180 Westbound Ramps	Signalized	39.3	D	39.9	D		96.7	F	103.0	F	6.3
74	N. Blackstone Ave./E Belmont Ave.	Signalized	96.1	F	101.1	F	5.0	196.0	F	199.5	F	3.5
75	N. Abby St./E. Belmont St.	Signalized	46.5	D	47.1	D		96.5	F	99.6	F	3.1
76	Fresno St./E. Belmont St.	Signalized	46.2	D	47.2	D		199.4	F	200.6	F	1.2
77	N. 1st St./E. Belmont St.	Signalized	43.6	D	42.3	D		126.4	F	127.9	F	1.5
78	N. Blackstone Ave./SR 180 Eastbound Ramps	Signalized	8.9	A	9.3	A		9.8	A	10.1	B	
79	N. Abby St./SR 180 Eastbound Ramps	Signalized	43.4	D	45.0	D		86.2	F	91.3	F	5.1

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
80	N. Blackstone Ave./SR 180 Westbound Ramps	Signalized	197.6	F	214.1	F	16.5	354.5	F	363.0	F	8.5
81	Broadway St./Amador St.	Two-Way Stop	18.6	C	18.8	C		*	F	*	F	*
82	Broadway St./San Joaquin St.	Two-Way Stop	28.9	D	28.9	D		*	F	*	F	*
83	F St./Fresno St.	Signalized	6.0	A	6.2	A		87.7	F	91.4	F	3.7
84	G St./Mono St.	Two-Way Stop	10.5	B	9.3	A		38.2	E	14.2	B	-24.0
85	H St./Mono St.	Two-Way Stop	12.2	B	12.2	B		14.2	B	14.1	B	-0.1
86	H St./Ventura St.	Two-Way Stop	46.0	E	47.3	E		*	F	491.1	F	
87	O St./Santa Clara St./SR 41 SB Off-Ramp	Four-Way Stop	15.0	C	15.1	C		69.3	F	70.3	F	1.0
88	M St./SR 41 SB On-Ramp	Not Used										
89	M St./San Benito St./SR 41 NB On-Ramp	Two-Way Stop	17.7	C	17.7	C		*	F	*	F	*
90	Broadway St./Santa Clara St.	Two-Way Stop	14.8	B	17.3	C		16.9	C	19.9	C	3.0

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
91	Van Ness Ave./E. Hamilton Ave.	All Way Stop	9.3	A	9.3	A		12.8	B	12.8	B	
92	S. Van Ness Ave./E. California Ave.	Two-Way Stop	63.1	F	*	F	*	*	F	*	F	*
93	S. Railroad Ave./E. Lorena Ave.	One-Way Stop	0.2	A	-	-		10.4	B	-	-	
94	S. Van Ness Ave./S. Railroad Ave.	One-Way Stop	10.6	B	-	-		28.6	D	-	-	
95	S. Railroad Ave./E. Florence Ave.	Two-Way Stop	10.6	B	-	-		20.1	C	-	-	
96	S. Golden State Blvd./E. Church Ave.	Signalized	41.8	D	65.3	E	23.5	185.5	F	261.3	F	75.8
97	S. Railroad Ave./E. Church Ave.	Signalized	6.1	A	-	-		35.8	D	-	-	
98	S. East Ave./E. Church Ave.	One-Way Stop	260	F	662.5	F	402.5	*	F	*	F	*
99	S. Sunland Ave./E. Church Ave.	Two-Way Stop	56.8	F	62.2	F	5.4	16.3	C	18.5	C	
100	S. East Ave./S. Railroad Ave.	One-Way Stop	11.5	B	-	-		36.7	E	-	-	
101	S. East Ave./S. Golden State Blvd.	Signalized	38.8	D	39.4	D		19.4	B	72.3	E	52.9

Table 5.4-2
Future plus Project Level-of-Service Summary Analysis for Fresno Station Area Study Intersections

Int. ID	Intersection	Control	No Project AM Peak Delay	No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	No Project PM Peak Delay	No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
102	S. Golden State Blvd./E. Jensen Ave.	Signalized	160.5	F	186	F	25.5	358.2	F	427.5	F	69.3
103	S. Railroad Ave./S. Orange Ave.	One-Way Stop	10.7	B	-	-		29.4	D	-	-	
104	S. Golden State Blvd./ S. Orange Ave.	Two-Way Stop	66.4	F	42	E		*	F	*	F	*

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.

* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

Note: Delay time is reported in seconds.

Acronym:
Int. = intersection
LOS = level of service

5.4.2 Kings/Tulare Regional Station Study Area

A. KINGS/TULARE REGIONAL STATION STUDY AREA ROADWAY SEGMENTS

Figure 5.4-3 illustrates the projected average daily traffic along the roadway segments for Future plus Project Conditions (i.e., after the project is built). Table 5.4-3 summarizes the results of the level-of-service analysis for the roadway segments under Future plus Project Conditions. As Table 5.4-3 shows, two of the roadway segments projected to operate at LOS E or F under Future No-Build Conditions are projected to continue to operate at LOS E or F. One additional roadway segment—Eighth Avenue/SR 43 between Grangeville Boulevard and SR 198 ramps—is projected to operate at LOS E or F under Future plus Project Conditions.

The following roadway segment is projected to be substantially impacted by the proposed project:

- Eighth Avenue/SR 43 between Grangeville Boulevard and SR 198 ramps

Table 5.4-3
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
1	SR 198, between 11th Ave. and 10th Ave.	2/2	Divided	46,672	46,672	F	F
2	SR 198, between 10th Ave. and 9th Ave.	2/2	Divided	28,700	29,630	D	D
3	SR 198, between 9th Ave. and 8th Ave./SR 43	2/2	Divided	23,150	24,110	D	D
4	8th Ave./SR 43, between Grangeville Blvd. and SR 198 Ramps	1/1	Undivided	12,850	14,960	D	E
5	8th Ave./SR 43, between SR 198 Ramps and Hanford Armona Rd.	1/1	Undivided	14,080	14,340	E	E
6	SR 198, between SR 198 Ramps and 7th Ave.	2/2	Divided	21,860	22,250	D	D
7	SR 198, between 7th Ave. and 6th Ave.	2/2	Divided	21,180	21,990	D	D
8	SR 198, between 6th Ave. and 2nd Ave.	2/2	Divided	19,320	20,080	D	D
9	SR 198, between 2nd Ave. and Road 48	2/2	Divided	20,240	20,940	D	D
10	SR 198, between Road 48 and Road 56/17th Ave.	2/2	Divided	30,126	30,126	D	D

Table 5.4-3
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
11	SR 198, between Road 56/17th Ave. and County Road 60	2/2	Divided	30,126	30,126	D	D
12	SR 198, between County Road 60 and County Road J25/Road 68	2/2	Divided	30,126	30,126	D	D
13	SR 198, between County Road J25/Road 68 and SR 99 Ramps	2/2	Divided	30,126	30,126	D	D

Source: Data collected by URS in 2010.
* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
ADT average daily traffic
LOS level of service
SR State Route

B. KINGS/TULARE REGIONAL STATION STUDY AREA INTERSECTIONS

Figure 5.4-4 illustrates the peak-hour turning movements at the study intersections under Future plus Project Conditions. Table 5.4-4 summarizes the results of the level-of-service analysis for the study intersections.

As illustrated in Table 5.4-4, five study intersections projected to operate at LOS E or F under Future No-Build Conditions are projected to continue to operate at LOS E or F. The following two additional intersections are projected to operate at LOS E or F under Future plus Project Conditions. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output).

- Eighth Avenue/SR 198 westbound ramps
- Eighth Avenue/SR 198 eastbound ramps

Seven of the study intersections are projected to be substantially impacted by the addition of the traffic from the proposed project. Those intersections are:

- Ninth Avenue/SR 198
- Eighth Avenue/SR 198 westbound ramps
- Eighth Avenue/SR 198 eastbound ramps
- Seventh Street/SR 198
- Sixth Street/SR 198
- Second Avenue/SR 198
- SR 43/Lacey Boulevard

Table 5.4-4

Future plus Project Level-of-Service Summary Analysis for Kings/Tulare Regional Station Area Study Intersections

Int. ID	Intersection	Control	No Project		Future plus Project Conditions		Increase in Delay	No Project		Future plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	9th Ave./SR 198	Two-Way Stop	124.2	F	135.1	F	10.9	101.9	F	118.7	F	16.8
2	8th Ave./SR 198 Westbound Ramps	One-Way Stop	13.2	B	14.1	B		24.1	C	36.3	E	12.2
3	8th Ave./SR 198 Westbound Ramps	One-Way Stop	20.0	C	24.3	C		27.0	D	84.6	F	57.6
4	7th St./SR 198	Two-Way Stop	432.5	F	574.9	F	142.4	*	F	*	F	*
5	7th St./7th Rd.	One-Way Stop	Not used									
6	6th St./SR 198	Two-Way Stop	43.1	E	51.2	F	8.1	*	F	*	F	*
7	2nd Ave./SR 198	Two-Way Stop	26.5	D	28.6	D		94.4	F	114.7	F	20.3
8	SR 43/Lacey Blvd.	One-Way Stop	36.6	E	202.4	F	165.8	52.8	F	899.3	F	846.5
9	SR 43/Grangeville Blvd.	Signalized	24.2	C	24.5	C		29.3	C	30.1	C	

* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.

Note: Delay time is reported in seconds.

Acronyms:
Int. = intersection
LOS = level of service
SR = State Route

5.4.3 Bakersfield Station Study Area

A. BAKERSFIELD STATION STUDY AREA ROADWAY SEGMENTS

Figures 5.4-5a and 5.4-5b illustrate the projected average daily traffic along the roadway segments for Future plus Project Conditions. Table 5.4-5 summarizes the results of the level-of-service analysis for the roadway segments under Future plus Project Conditions. As illustrated in Table 5.4-5, four of the roadway segments projected to operate at LOS E or F under Future No-Build Conditions are projected to continue to operate at LOS E or F. No additional roadway segments are projected to operate at LOS E or F with the addition of the traffic from the proposed project.

None of the roadway segments are projected to be substantially impacted by the proposed project.

B. BAKERSFIELD STATION STUDY AREA INTERSECTIONS

Two station locations in Bakersfield were studied: the Bakersfield Station–North Alternative and the Bakersfield Station–South Alternative.

Figures 5.4-6a through 5.4-6e illustrate the peak-hour turning movements at the study intersections under Future plus Project Conditions (North and South alternatives). Table 5.4-6 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output).

As illustrated in Table 5.4-6, 23 study intersections that are projected to operate at LOS E or F, under Future No-Build Conditions are to continue to operate at LOS E or F (North and South alternatives). The following intersections are projected to operate at LOS E or F under Future plus Project Conditions (North and South alternatives).

- S. Union Avenue/E. Brundage Lane
- SR 99 ramps/California Avenue

Eleven of the study intersections are projected to be substantially impacted by the proposed project (North and South alternatives). Those intersections are:

- S. Union Avenue/eastbound SR 58 ramps
- S. Union Avenue/E. Brundage Lane
- Liggett Street and E. Brundage Lane
- P Street/Eighth Street
- SR 99 ramps/California Avenue
- Oak Street/California Avenue
- Union Avenue/California Avenue
- Oak Street/Truxtun Avenue
- Union Avenue/Golden State Avenue/Twenty-first Street
- Q Street/Golden State Avenue
- M Street/Twenty-eighth Street/Golden State Avenue

Figures 5.4-7 through 5.4-9 illustrate the projected level of service at the study intersections in the cities of Fresno, Hanford, and Bakersfield.

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Future (No Project)	Future plus Project (North)	Future plus Project (South)	Future (No Project)	Future plus Project (North)	Future plus Project (South)
1	California Ave., between Real Rd. and Oak St.	3/3	Divided	41,930	*	43,970	B	*	C
2	California Ave., between Oak St. and A St.	3/3	Divided	21,460	*	23,670	A	*	A
3	California Ave., between N St. and P St.	3/3	Divided	19,830	*	22,280	A	*	A
4	California Ave., between P St. and Union Ave.	3/3	Divided	22,240	*	24,790	A	*	A
5	California Ave., between Union Ave. and Beale Ave.	3/3	Divided	22,240	*	22,610	A	*	A
6	California Ave., between Martin Luther King Jr. Blvd. and Mt. Vernon Ave.	2/2	Divided	12,210	*	12,580	A	*	A
7	P St., between 8th St. and California Ave.	2/2	Undivided	12,250	*	12,350	A	*	A
8	Q St., between California Ave. and 14th St.	2/2	Undivided	12,990	*	12,990	A	*	A
9	Chester Ave., between 24th St. and 30th St.	2/2	Divided	18,660	*	18,670	A	*	A
10	Brundage Ln., between Chester Ave. and Oak St.	2/2	Undivided	13,390	*	13,420	A	*	A
11	Union Ave., between Brundage Ln. and 4th St.	3/3	Divided	42,330	*	44,300	B	*	C
12	Union Ave., between 4th St. and California Ave.	3/3	Divided	45,530	*	47,500	C	*	C
13	Union Ave., between California Ave.	3/3	Divided	46,810	47,410	47,420	C	C	C

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Future (No Project)	Future plus Project (North)	Future plus Project (South)	Future (No Project)	Future plus Project (North)	Future plus Project (South)
	and Hayden Ct.t								
14	Union Ave., between Hayden Ct. and 21st St.	3/3	Divided	52,360	*	53,620	D	D	D
15	Union Ave., between 21st St. and Espee St.	3/3	Divided	41,480	*	42,070	B	*	B
16	SR 178, between Oak St. and Buck Owens Blvd./SR 99 Northbound Ramps	4/4	Divided	66,350	*	66,510	D	*	D
17	SR 178, between 23rd St. and Chester Ave.	0/4	One-Way	39,260	*	39,260	E	*	E
18	Beale Ave., between Truxtun Ave. and Monterey St.	2/2	Divided	16,940	*	17,400	A	*	A
19	Beale Ave., between Niles St. and Flower St.	2/2	Divided	14,660	*	15,120	A	*	A
20	Beale Ave., between Truxtun Ave and California Ave.	1/1	Undivided	1,900	*	1,900	A	*	A
21	Mt. Vernon Ave., between Brundage Ln. and California Ave.	2/2	Divided	22,010	*	22,160	A	*	A
22	Truxtun Ave., between Oak St. and F St.	3/3	Divided	35,570	*	36,000	A	*	A
23	Truxtun Ave., between Oak St. and Bahamas Dr.	3/3	Divided	51,290	*	51,560	D	*	D
24	Truxtun Ave., between Q St. and Beale Ave.	3/3	Divided	22,560	*	22,750	A	*	A

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Future (No Project)	Future plus Project (North)	Future plus Project (South)	Future (No Project)	Future plus Project (North)	Future plus Project (South)
25	Chester Ave., between 30th St. and 34th St.	2/2	Divided	25,180	*	25,320	B	*	B
26	F St., between Golden State Ave. and 30th St.	2/2	Undivided	17,820	*	17,880	A	*	A
27	F St., between 30th St. and 24th St.	2/2	Undivided	15,280	*	15,340	A	*	A
28	F St., between 24th St. and 23rd St.	2/2	Divided	16,120	*	16,180	A	*	A
29	F St., between 23rd St. and 21st St.	2/2	Undivided	10,020	*	10,080	A	*	A
30	F St., between 21st St. and Truxtun Ave.	2/2	Undivided	8,790	*	8,790	A	*	A
31	23rd St., between 24th St. and F St.	4/0	One-Way	36,800	*	36,800	E	*	E
32	23rd St., between F St. and Chester Ave.	4/0	One-Way	36,780	*	36,780	E	*	E
33	Oak St., between SR 178 and Truxtun Ave.	2/2	Undivided	36,330	*	36,490	F	*	F
34	Truxtun Ave., between F St. and Chester Ave.	3/3	Divided	35,560	*	35,990	A	*	A
35	Truxtun Ave., between Chester Ave. and Q St.	3/3	Divided	28,800	*	29,130	A	*	A
36	California Ave., between A St. and Chester Ave.	3/3	Divided	25,750	*	27,990	A	*	A
37	Chester Ave., between California Ave. and 4th St.	2/2	Undivided	16,850	*	16,850	A	*	A

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS		
				Future (No Project)	Future plus Project (North)	Future plus Project (South)	Future (No Project)	Future plus Project (North)	Future plus Project (South)
38	Chester Ave., between 4th St. and Brundage Ln.	2/2	Undivided	19,450	*	19,500	B	*	B
39	California Ave., between S. King St. and S. Owens St.	3/3	Divided	15,050	*	15,420	A	*	A
40	California Ave., between S. Owens St. and Mt. Vernon Ave.	3/3 & 2/2	Divided	12,210	*	12,580	A	*	A
41	Monterey St., between Beale Ave. and Williams St.	3/0	One-Way	8,050	*	8,050	A	*	A
42	Niles St., between Beale Ave. and Williams St.	0/3	One-Way	7,760	*	7,760	A	*	A
43	Q St., between 23rd St. and 19th St.	2/2	Undivided	17,650	*	17,650	A	*	A
44	Q St., between 19th St. and Truxtun Ave.	2/2	Undivided	16,440	*	16,440	A	*	A
45	Chester Ave., between 23rd St. and Truxtun Ave.	2/2	Divided	19,780	*	19,790	A	*	A
46	Chester Ave., between Truxtun Ave. and California Ave.	2/2	Divided	18,690	*	18,760	A	*	A

Source: Data collected by URS in 2010.

Notes:

*Same as South Alternative.

LOS is based on volume-to-capacity ratios.

Acronyms:

LOS level of service
SR State Route

Table 5.4-6
Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area Study Intersections

Int. ID	Intersection	Control	No Project		Future plus Project Conditions (South Alternative)		Increase in Delay*	No Project		Future plus Project Conditions (South Alternative)		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	S. Union Ave./Eastbound SR 58 Ramps	Signalized	128.3	F	139.6	F	11.3	22.8	C	23.5	C	
2	Mt. Vernon Ave./Eastbound SR 58 Ramps	Signalized	16.5	B	16.8	B		29.1	C	29.9	C	
3	Wible Rd./Oak St./Brundage Ln./Stockdale Hwy.	Signalized	28.2	C	28.3	C		81.6	F	81.9	F	0.3
4	Chester Ave./Brundage Ln.	Signalized	22.0	C	21.9	C		27.5	C	27.6	C	
5	P St./Brundage Ln.	Signalized	14.8	B	14.9	B		22.2	C	22.5	C	
6	S. Union Ave./E. Brundage Ln.	Signalized	36.4	D	41.1	D		53.1	D	60.2	E	7.1
7	Liggett St. and E. Brundage Ln.	Signalized	61.7	E	69.8	E	8.1	44.3	D	46.9	D	
8	Mt. Vernon Ave./E. Brundage Ln.	Signalized	23.8	C	23.9	C		38.1	D	38.8	D	
9	Chester Ave./4th St.	Signalized	11.5	B	11.5	B		15.9	B	16.1	B	
10	P St./4th St.	Signalized	5.7	A	5.7	A		7.3	A	7.3	A	
11	Union Ave./4th St.	Signalized	14.4	B	15.0	B		21.4	C	22.3	C	
12	Chester Ave./8th St.	Signalized	7.8	A	7.8	A		9.2	A	9.2	A	
13	P St./8th St.	All-Way Stop	17.1	C	17.6	C		135.2	F	140.8	F	5.6
14	Real Rd./California Ave.	Signalized	55.8	E	55.8	E	0.0	151.1	F	151.6	F	0.5
15	SR 99 Ramps/California	Signalized	27.4	C	32.9	C		46.8	D	57.0	E	10.2

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment		Number of Lanes	Divided/ Undivided	Average Daily Traffic				LOS			
					Future (No Project)		Future plus Project (North)	Future plus Project (South)	Future (No Project)		Future plus Project (North)	Future plus Project (South)
	Ave.											
16	Oak St./California Ave.	Signalized	35.3	D	36.5	D		63.7	E	70.2	E	6.5
17	A St./California Ave.	Signalized	19.3	B	19.9	B		15.1	B	15.4	B	
18	Oleander Ave./California Ave.	Signalized	7.9	A	8.0	A		6.4	A	6.3	A	
19	H St./California Ave.	Signalized	26.9	C	27.9	C		43.0	D	49.1	D	
20	Chester Ave./California Ave.	Signalized	21.3	C	22.5	C		29.3	C	30.8	C	
21	N St./California Ave.	Signalized	8.0	A	7.9	A		6.4	A	6.4	A	
22	P St./California Ave.	Signalized	23.8	C	25.3	C		38.9	D	41.6	D	
23	Union Ave./California Ave.	Signalized	36.1	D	39.7	D		66.6	E	76.1	E	9.5
24	King St./California Ave.	Signalized	15.2	B	15.2	B		13.7	B	13.7	B	
25	Owens St./California Ave.	Signalized	11.4	B	11.4	B		14.4	B	14.2	B	
26	Martin Luther King Jr. Blvd./Haley St./California Ave.	Signalized	13.2	B	13.3	B		13.1	B	13.1	B	
27	Mt. Vernon Ave./California Ave.	Signalized	23.7	C	24.0	C		30.3	C	30.9	C	
28	Q St./14th St.	Signalized	2.6	A	2.6	A		7.0	A	7.0	A	
29	Union Ave./Hayden Ct.	Signalized	21.4	C	31.4	C		26.6	C	40.4	D	
30	Oak St./Truxtun Ave.	Signalized	62.3	E	63.0	E	0.7	169.1	F	175.0	F	5.9
31	F St./Truxtun Ave.	Signalized	13.4	B	13.4	B		34.5	C	34.7	C	

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment		Number of Lanes	Divided/ Undivided	Average Daily Traffic				LOS			
					Future (No Project)		Future plus Project (North)	Future plus Project (South)	Future (No Project)		Future plus Project (North)	Future plus Project (South)
32	H St./Truxtun Ave.	Signalized	24.2	C	24.6	C		63.9	E	65.3	E	1.4
33	Chester Ave./Truxtun Ave.	Signalized	24.4	C	24.6	C		35.0	C	35.6	D	
34	L St./Truxtun Ave.	Signalized	34.6	C	35.2	D		33.0	C	33.4	C	
35	N St./Truxtun Ave.	Signalized	15.2	B	15.2	B		12.4	B	12.4	B	
36	Q St./Truxtun Ave.	Signalized	34.2	C	34.3	C		41.9	D	42.2	D	
37	E. Truxtun Ave./Beale Ave./E. 19th St.	Signalized	12.0	B	12.0	B		11.8	B	11.9	B	
38	Q St./19th St.	Signalized	9.0	A	9.0	A		21.7	C	21.7	C	
39	F St./21st St.	Signalized	7.9	A	7.9	A		7.6	A	7.6	A	
40	Q St./21st St.	Signalized	9.8	A	9.8	A		18.9	B	18.9	B	
41	Union Ave./Golden State Ave./21st St.	Signalized	38.9	D	42.6	D		94.2	F	122.0	F	27.8
42	F St./23rd St.	Signalized	138.6	F	139.7	F	1.1	173.2	F	173.4	F	0.2
43	Chester Ave./23rd St.	Signalized	48.3	D	48.3	D		112.6	F	112.7	F	0.1
44	Q St./23rd St.	Two-Way Stop	52.3	F	52.3	F	0.0	*	F	*	F	*
45	SR 178/SR 99 Southbound Ramps	Signalized	64.5	E	65.5	E	1.0	43.0	D	44.5	D	
46	SR 178/SR 99 Ramps/Buck Owens Blvd.	Signalized	107.4	F	108.4	F	1.0	198.3	F	201.0	F	2.7
47	Oak St./SR 178	Signalized	340.5	F	342.0	F	1.5	545.2	F	547.0	F	1.8
48	F St./24th St.	Signalized	103.3	F	103.8	F	0.5	172.7	F	172.8	F	0.1
49	Chester Ave./24th St.	Signalized	56.2	E	56.5	E	0.3	152.1	F	152.1	F	0.0

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment		Number of Lanes	Divided/ Undivided	Average Daily Traffic				LOS			
					Future (No Project)	Future plus Project (North)		Future plus Project (South)	Future (No Project)	Future plus Project (North)		Future plus Project (South)
50	Beale Ave./Monterey St.	Signalized	13.0	B	13.2	B		12.6	B	12.8	B	
51	Q St./Golden State Ave.	Signalized	23.1	C	23.5	C		157.9	F	162.8	F	4.9
52	Union Ave./Espee St.	Signalized	13.1	B	13.2	B		69.2	E	72.5	E	3.3
53	Beale Ave./Niles St.	Signalized	17.8	B	17.9	B		13.2	B	13.4	B	
54	William St./Niles St.	Two-Way Stop	11.0	B	11.0	B		12.0	B	12.0	B	
55	Mt. Vernon Ave./Niles St.	Signalized	25.1	C	25.2	C		36.3	D	36.6	D	
56	M St./28th St./Golden State Ave.	Signalized	197.1	F	200.1	F	3.0	320.7	F	325.3	F	4.6
57	Union Ave./W. Niles St.	Signalized	33.3	C	35.1	D		46.8	D	47.5	D	
58	F St./30th St.	Signalized	15.8	B	15.8	B		30.4	C	30.4	C	
59	Beale Ave./Flower St.	Signalized	21.5	C	21.8	C		27.3	C	27.6	C	
60	F St./Golden State Ave.	Signalized	189.5	F	193.4	F	3.9	491.4	F	492.5	F	1.1
61	Beale Ave./Jefferson St.	One-Way Stop	15.0	B	15.8	C		22.9	C	24.0	C	
62	Chester Ave./34th St.	Signalized	14.7	B	14.7	B		31.1	C	31.0	C	
63	Union Ave./34th St./Bernard St.	Signalized	53.4	D	53.5	D		51.9	D	51.9	D	
64	Chester Ave./W. Columbus St.	Signalized	7.9	A	7.9	A		52.2	D	53.7	D	
65	Union Ave./Columbus St.	Signalized	31.4	C	31.7	C		74.4	E	75.2	E	0.8

Table 5.4-5
Roadway Segments Future plus Project Level-of-Service Summary Analysis for Bakersfield Station Area

No.	Roadway Segment		Number of Lanes	Divided/ Undivided	Average Daily Traffic			LOS			
					Future (No Project)	Future plus Project (North)	Future plus Project (South)	Future (No Project)		Future plus Project (North)	Future plus Project (South)
66	Chester Ave./30th St./SR 99 Ramps and 30th St.	Round-about									
67	L St./California St.	Signalized	2.9	A	2.9	A	39.2	D	38.5	D	

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.

* Highlighted values indicate study intersections projected to be substantially affected by the proposed project.

Notes:
Delay time is reported in seconds.

The tabulated results are the same for both North and South alternatives except for Intersection#29. The Delay/LOS for this intersection in North Alternative for AM and PM is 25.1/C and 33.2/C, respectively.

Acronym:
Int. = intersection
LOS = level of service

5.4.4 Heavy Maintenance Facility Site Alternatives

Five site alternatives for the construction of a heavy maintenance facility (HMF) were identified along the Fresno to Bakersfield Section: the Fresno Works–Fresno HMF site, the Kings County–Hanford HMF site, the Kern Council of Governments–Wasco HMF site, the Kern Council of Governments–Shafter East HMF site, and the Kern Council of Governments–Shafter West HMF site. Because there is no discernable difference in transportation impacts between the Shafter East and the Shafter West HMF sites, these two sites are considered together as the "Shafter HMF sites." The following is summarized from the proposals for each of the facility locations.

A. HMF SITE ALTERNATIVES

This section describes the HMF site alternatives.

Fresno Works–Fresno HMF Site

Three potential locations for an HMF have been proposed just south of Fresno and SR 99. Two proposed sites would relocate Cedar Avenue, and build grade-separation structures on American and Lincoln avenues. Jefferson Avenue would be closed to through traffic at the BNSF railroad. The third alternative would be next to SR 99 at Central Avenue; this alternative would avoid relocation of Cedar Avenue, and only one grade-separation structure would be necessary (at Central Avenue). The proposals for these sites determined there would be no adverse traffic impacts.

Kings County–Hanford HMF Site

The potential HMF site in Kings County would be southeast of the city of Hanford, bordered by SR 43, Houston Avenue, the HST corridor, and Idaho Avenue. Iona Avenue, which is between Idaho and Houston avenues, would be closed to through traffic and could serve as the main entrance to the site. Additional entrances could be considered on Houston and Idaho avenues. The Houston Avenue entrance could accept local traffic, as well as traffic originating from Tulare, Fresno, and northern Kings counties. The Idaho entrance can accept traffic from southern Kings and Tulare counties.

At shift changes, the HMF would result in increases in traffic on SR 43 in the north and south directions, and on SR 198 from workers connecting to SR 43. As noted for the Kings/Tulare Regional Station location, SR 198 east of SR 43 is currently functioning at levels of service of E and F at peak hour. Worker shift changes overlapping with the existing traffic peak hour could result in increases in delay of 2 or more seconds on SR 43 east of SR 198; these impacts would be potentially significant.

Kern Council of Governments–Wasco HMF Site

The Kern Council of Governments–Wasco HMF site would be on the east side of Wasco, with access from J Street, between Sixth Street and Poso Avenue. Nearby, SR 46 is an east-west two-lane highway to north of the site, and SR 43 (F Street) runs north–south and is located west of the site. is Plans have been made for widening nineteen miles of SR 46 within Wasco to a four-lane divided highway. The site proposal did not identify any existing traffic points with heavy congestion or changes in level of service with the project; therefore, any associated impacts would be less than significant.

Kern Council of Governments–Shafter HMF Sites

The HMF sites in Shafter would be north of Bakersfield and accessed from 7th Standard Road, a two-lane road planned for improvement to four lanes. The proposal for these sites determined

that at either site the HMF would result in no substantial change in level of service; therefore, any associated effects would not be substantial.

A summary of the qualitative analysis for the HMF is provided in Appendix G (Qualitative Analysis for HMF).

B. TRIP GENERATION AND TRIP DISTRIBUTION

Both daily and peak-hour traffic from the proposed project were estimated based on the anticipated construction workforce by project component. The daily forecasted trips at each of the HMF locations were used to determine how many station-related trips would occur during the peak hour. Table 5.4-7 summarizes the projected trip generation for the HMF site alternatives.

Table 5.4-7
Trip Generation for HMF Site Alternatives

HMF Site Alternative	Daily Trips	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
Fresno	3,000	60:40	180	120	300	40:60	120	180	300
Hanford	3,000	60:40	180	120	300	40:60	120	180	300
Wasco	3,000	60:40	180	120	300	40:60	120	180	300
Shafter	3,000	60:40	180	120	300	40:60	120	180	300
HMF = heavy maintenance facility									

The forecasted daily trips at each of the HMF locations were distributed on the transportation network based on the results of the regional travel demand models and access to and from the proposed HMF location area. Trip generation assumed that 10% of the total daily trips will occur during the peak hour. Figures 5.1-1 through 5.1-3 illustrate the trip distribution percentage for the proposed project. Figures 5.1-4 through 5.1-6 illustrate the peak-hour project-only trips at the study intersections.

C. EXISTING CONDITIONS

Study Roadway Segments

An analysis of existing roadway segments was conducted based on the Florida tables for the Fresno and Hanford segments, and the analysis for the Shafter and Wasco segments was performed using v/c ratio. The purpose of conducting the roadway segment analysis is to determine the current adequacy of the roadways and to provide a baseline for future comparison of the roadway segments. The study roadway segments analyzed have been chosen based on major roadways that will be used for ingress and egress to the HMF. URS collected the ADT volumes at the study roadway segments during March 2011. The ADT volumes are provided in Appendix A (Traffic Counts Data). Figures 5.4-14 through 5.4-17 illustrate the ADT and number of lanes for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively.

Study Intersections

URS personnel collected peak-hour (AM and PM) turning-movement volumes at the study intersections during March 2011. Peak-hour turning-movement volumes at the study intersections were collected from 7 to 9 a.m. and from 4 to 6 p.m. Figures 5.4-10 through 5.4-13 illustrate the

study intersections for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively.

The existing lane geometries and traffic control are illustrated on Figures 5.4-18 through 5.4-21 for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively. The existing peak-hour turning-movement volumes at the study intersections are illustrated on Figures 5.4-22 through 5.4-25 for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives. The existing peak-hour turning-movement volumes are provided in Appendix A (Traffic Counts Data).

The LOS analysis was conducted based on the methodology documented in the earlier section using Synchro Software. Detailed calculations for the LOS analysis are provided in Appendix B (Existing Synchro Output). Figures 5.4-26 through 5.4-29 illustrate the existing level of service for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives.

Fresno Works–Fresno HMF Site

Table 5.4-8 summarizes the roadway segment analysis for the Fresno Works–Fresno HMF site.

Table 5.4-8
Existing Roadway Segment Analysis: Fresno Works–Fresno HMF Site

No	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	Central Ave., between S. Cedar Ave. and S. Maple Ave.	1/1	Undivided	2,966	C
2	E. American Ave., between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	915	C
3	E. Adams Ave. between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	1,702	C

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service

As illustrated in Table 5.4-8, all roadway segments under existing conditions operate at acceptable LOS.

Table 5.4-9 summarizes the intersection analysis for the Fresno Works–Fresno HMF site.

Table 5.4-9
Existing Intersection Analysis: Fresno Works–Fresno HMF Site

Int. D	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Cedar Ave./E. Central Ave.	All-Way Stop	8.8	A	8.4	A
2	SR 99 SB Off-Ramp/E. Central Ave.	One-Way Stop	197.2	F	25.1	D
3	SR 99 NB On-Ramp/E. Central Ave.	Free (Yield)	1.4	A	1.8	A
4	SR 99 NB Off-Ramp/S. Chestnut Ave.	One-Way Stop	371.9	F	20.9	C
5	SR 99 SB On-Ramp/S. Chestnut Ave.	Free (Yield)	3.7	A	6.0	A

Table 5.4-9
Existing Intersection Analysis: Fresno Works–Fresno HMF Site

Int. D	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
6	SR 99 SB Off-Ramp/E. American Ave.	One-Way Stop	10.4	B	10.2	B
7	SR 99 NB On-Ramp/E. American Ave.	Free (Yield)	2.2	A	3.5	A
8	Chestnut Ave./Adams Ave.	All-Way Stop	8.4	A	8.4	A
9	SR 99 SB Off-Ramp/Clayton Ave.	One-Way Stop	9.0	A	9.5	A
10	Clovis Ave./SR 99 NB off-ramp	One-Way Stop	11.7	B	12.7	B
11	Clovis Ave./SR 99 SB on-ramp	One-Way Stop	46.9	E	37.9	E

Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service
NB = northbound
SB = southbound
SR = State Route

As illustrated in Table 5.4-9, all intersections under existing conditions operate at acceptable LOS, except the following intersections:

- SR 99 southbound off-ramp/E. Central Avenue
- SR 99 northbound off-ramp/S. Chestnut Avenue
- Clovis Avenue/SR 99 southbound on-ramp

Kings County–Hanford HMF Site

Table 5.4-10 summarizes the roadway segment analysis for the Kings County–Hanford HMF site.

Table 5.4-10
Existing Roadway Segment Analysis: Kings County–Hanford HMF Site

No	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	SR 43 between SR 198 and Houston Avenue	1/1	Undivided	8,560	D
2	SR 43 between Houston Avenue and Idaho Avenue	1/1	Undivided	6,656	D
3	Houston Avenue between SR 43 and 7th Avenue	1/1	Undivided	3,694	C
4	Idaho Avenue between SR 43 and 7th Avenue	1/1	Undivided	556	C

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
NE = northeast
SW = southwest
SR = State Route

As illustrated in Table 5.4-10, all roadway segments under existing conditions operate at acceptable LOS.

Table 5.4-11 summarizes the intersection analysis for the Kings County–Hanford HMF site.

Table 5.4-11
Existing Intersection Analysis: Kings County–Hanford HMF Site

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Central Valley Hwy./Houston Ave.	Signalized	26.2	C	37.8	D
2	7th Ave./Houston Ave.	Two-Way Stop	9.9	A	10.3	B
3	Central Valley Hwy./Idaho Ave.	Two-Way Stop	11.8	B	13.5	B
4	7th Ave./Idaho Ave.	Two-Way Stop	9.4	A	9.1	A

HMF = heavy maintenance facility
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-11, all intersections under existing conditions operate at acceptable LOS.

Kern Council of Governments–Wasco HMF Site

Table 5.4-12 summarizes the roadway segment analysis for the Kern Council of Governments–Wasco HMF site.

Table 5.4-12
Existing Roadway Segment Analysis: Kern Council of Governments–Wasco HMF Site

No	Roadway Segment	# of Lanes (NE/SW)	Divided/Undivided	ADT	LOS
1	SR 43, North of SR 46	1/1	Undivided	3,164	A
2	SR 46, between F St. and Wasco Ave.	1/1	Undivided	9,098	B
3	SR 46, East of Wasco Ave.	1/1	Undivided	6,626	A
4	Wasco Ave., between SR 46 and 6th St.	1/1	Undivided	2,402	A

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
SR = State Route

As illustrated in Table 5.4-12, all roadway segments under existing conditions operate at acceptable LOS.

Table 5.4-13 summarizes the intersection analysis for the Kern Council of Governments–Wasco HMF site.

Table 5.4-13
Existing Intersection Analysis: Kern Council of Governments–Wasco HMF Site

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Wasco Ave./Paso Robles Hwy.	Two-Way Stop	18.0	C	22.7	C
2	Wasco Ave./6th St.	Two-Way Stop	10.2	B	10.2	B

Acronyms:
HMF = heavy maintenance facility
Hwy. = Highway
Int. = intersection
LOS = level of service
SR = State Route

As illustrated in Table 5.4-13, all intersections under existing conditions operate at acceptable LOS.

Kern Council of Governments–Shafter HMF Sites

Table 5.4-14 summarizes the roadway segment analysis for the Kern Council of Governments–Shafter HMF sites.

Table 5.4-14
Existing Roadway Segment Analysis: Kern Council of Governments–Shafter HMF Sites

No	Roadway Segment	# of Lanes (NE/SW)	Divided/Undivided	ADT	LOS
1	Santa Fe Way between Burbank Street and 7th Standard Road	1/1	Undivided	8,142	A

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
NE = northeast
SW = southwest

As illustrated in Table 5.4-14, the roadway segment under existing conditions operates at acceptable LOS.

Table 5.4-15 summarizes the intersection analysis for the Kern Council of Governments–Shafter HMF sites.

Table 5.4-15
Existing Intersection Analysis: Kern Council of Governments–Shafter HMF Sites

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Santa Fe Way/Burbank Street	Two-Way Stop	15.9	C	15.3	C
2	Santa Fe Way/Galpin	Signalized	5.5	A	5.3	A

Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-15, all intersections under existing conditions operate at acceptable LOS.

D. EXISTING PLUS HMF CONDITIONS

Level-of-service analysis at the study intersections and roadway segments was conducted for Existing plus HMF Conditions to evaluate the impacts at the roadway segments and study intersections due to the addition of traffic from the proposed Heavy Maintenance Facility. Figures 5.4-30 through 5.4-33 illustrate the project-only trips for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives.

Fresno Works–Fresno HMF Site

Study Roadway Segments

Figure 5.4-34 illustrates the projected average daily traffic along the roadway segments and number of lanes for Existing plus HMF Conditions. Table 5.4-16 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus HMF Conditions.

As shown in Table 5.4-16, none of the roadway segments is projected to be substantially impacted by the HMF.

Table 5.4-16
Existing plus HMF Roadway Segments Level-of-Service Summary Analysis for Fresno Works–Fresno HMF Site

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No HMF)	Existing plus HMF	Existing (No HMF)	Existing plus HMF
1	Central Ave. between S. Cedar Ave. and S. Maple Ave.	1/1	Undivided	2,966	3,556	C	C
2	E. American Ave. between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	915	2,185	C	C
3	E. Adams Ave. between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	1,702	1,702	C	C

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
HMF = heavy maintenance facility
LOS = level of service

Study Intersections

Figure 5.4-35 illustrates the peak-hour turning movements at the study intersections under Existing plus HMF Conditions. Table 5.4-17 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). As illustrated in Table 5.4-17, three study intersections

projected to operate at LOS E or F under Existing Conditions are projected to continue to operate at LOS E or F. The following two study intersections are projected to be substantially impacted by the proposed HMF. Figure 5.4-36 illustrates the level of service at the study intersections under Existing plus HMF Conditions.

- SR 99 southbound off-ramp/E. Central Avenue
- Clovis Avenue/SR 99 southbound on-ramp

Table 5.4-17

Existing plus HMF Level-of-Service Summary Analysis for Fresno Works–Fresno HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Cedar Ave./E Central Ave.	All-Way Stop	8.8	A	8.8	A		8.4	A	8.4	A	
2	SR 99 SB Off-Ramp/E Central Ave.	One-Way Stop	197.2	F	248.9	F	51.7	25.1	D	29.9	D	4.8
3	SR 99 NB On-Ramp/E Central Ave.	Free (Yield)	1.4	A	1.7	A		1.8	A	2.2	A	
4	SR 99 NB Off-Ramp/ S. Chestnut Ave.	One-Way Stop	371.9	F	371.9	F		20.9	C	20.9	C	
5	SR 99 SB On-Ramp/S. Chestnut Ave.	Free (Yield)	3.7	A	3.7	A		6.0	A	6.0	A	
6	SR 99 SB Off-Ramp/E American Ave.	One-Way Stop	10.4	B	11.3	B		10.2	B	10.5	B	
7	SR 99 NB On-Ramp/E American Ave.	Free (Yield)	2.2	A	3.2	A		3.5	A	4.2	A	
8	Chestnut Ave./Adams Ave.	All-Way Stop	8.4	A	8.4	A		8.4	A	8.4	A	
9	SR 99 SB Off-Ramp/ Clayton Ave.	One-Way Stop	9.0	A	9.1	A		9.5	A	9.8	A	
10	Clovis Ave./SR 99 NB Off-Ramp	One-Way Stop	11.7	B	15.3	C		12.7	B	14.1	B	
11	Clovis Ave./SR 99 SB On-Ramp	One-Way Stop	46.9	E	169.7	F	122.8	37.9	E	266.7	E	228.8

Note: Delay time is reported in seconds.

Acronyms:

HMF = heavy maintenance facility

Int. = intersection

Table 5.4-17

Existing plus HMF Level-of-Service Summary Analysis for Fresno Works–Fresno HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	

LOS = level of service
SR = State Route

Kings County–Hanford HMF Site

Study Roadway Segments

Figure 5.4-37 illustrates the projected average daily traffic along the roadway segments and number of lanes for Existing plus HMF Conditions. Table 5.4-18 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus HMF Conditions.

As illustrated in Table 5.4-18, none of the roadway segments is projected to be substantially impacted by the HMF.

Table 5.4-18
Existing plus HMF Roadway Segments Level-of-Service Summary Analysis for Kings County–Hanford HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No HMF)	Existing plus HMF	Existing (No HMF)	Existing plus HMF
1	SR 43, between SR 198 and Houston Ave.	1/1	Undivided	8,560	9,670	D	D
2	SR 43, between Houston Ave, and Idaho Ave.	1/1	Undivided	6,656	7,686	D	D
3	Houston Ave., between SR 43 and 7th Ave.	1/1	Undivided	3,694	4,174	C	C
4	Idaho Ave., between SR 43 and 7th Ave.	1/1	Undivided	556	806	C	C

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
HMF = heavy maintenance facility
LOS level of service
SR State Route

Study Intersections

Figure 5.4-38 illustrates the peak-hour turning movements at the study intersections under Existing plus HMF Conditions. Table 5.4-19 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). As illustrated in Table 5.4-19, none of the study intersections are projected to be substantially impacted by the proposed HMF. Figure 5.4-39 illustrates the level of service at the study intersections under Existing plus HMF Conditions.

Table 5.4-19

Existing plus HMF Level-of-Service Summary Analysis for Kings County–Hanford HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Central Valley Hwy/Houston Ave.	Signalized	26.2	C	28.3	C		37.8	D	50.9	D	
2	7th Ave./Houston Ave.	Two-Way Stop	9.9	A	10	B		10.3	B	10.4	B	
3	Central Valley Hwy/Idaho Ave.	Two-Way Stop	11.8	B	13.5	B		13.5	B	15.3	C	
4	7th Ave./Idaho Ave.	Two-Way Stop	9.4	A	9.4	A		9.1	A	9.1	A	

Note: Delay time is reported in seconds.

Acronyms:
HMF = heavy maintenance facility
Hwy = highway
Int. = intersection
LOS level of service

Kern Council of Governments–Wasco HMF Site

Study Roadway Segments

Figure 5.4-40 illustrates the projected average daily traffic along the roadway segments and number of lanes for Existing plus HMF Conditions. Table 5.4-20 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus HMF Conditions.

As illustrated in Table 5.4-20, none of the roadway segments is projected to be substantially impacted by the HMF.

Table 5.4-20
Existing plus HMF Roadway Segments Level-of-Service Summary Analysis for the Kern Council of Governments–Wasco HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No HMF)	Existing plus HMF	Existing (No HMF)	Existing plus HMF
1	SR 43, North of SR 46	1/1	Undivided	3,164	4,094	A	A
2	SR 46, between F St. and Wasco Ave.	1/1	Undivided	9,098	10,178	B	B
3	SR 46, East of Wasco Ave.	1/1	Undivided	6,626	7,346	A	A
4	Wasco Ave., between SR 46 and 6th St.	1/1	Undivided	2,402	3,692	A	A

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
HMF = heavy maintenance facility
LOS = level of service
SR = State Route

Study Intersections

Figure 5.4-41 illustrates the peak-hour turning movements at the study intersections under Existing plus HMF Conditions. Table 5.4-21 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). As illustrated in Table 5.4-21, one study intersection (Intersection ID Wasco Avenue/Paso Robles Highway) is projected to be substantially impacted by the proposed HMF. Figure 5.4-42 illustrates the level of service at the study intersections under Existing plus HMF Conditions.

Table 5.4-21
Existing plus HMF Level-of-Service Summary Analysis for Kern Council of Governments–Wasco HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Wasco Ave./Paso Robles Hwy.	Two-Way Stop	18	C	33.7	D		22.7	C	64.9	F	42.2
2	Wasco Ave./6th St.	Two-Way Stop	10.2	B	10.5	B		10.2	B	10.5	B	

Note: Delay time is reported in seconds.
Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS level of service

Kern Council of Governments–Shafter HMF Sites

Study Roadway Segments

Figure 5.4-43 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Existing plus HMF Conditions. Table 5.4-22 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus HMF Conditions.

As illustrated in Table 5.4-22, no roadway segment is projected to be substantially impacted by the HMF.

Table 5.4-22
Existing plus HMF Roadway Segments Level-of-Service Summary Analysis for the Kern Council of Governments–Shafter HMF Sites

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No HMF)	Existing plus HMF	Existing (No HMF)	Existing plus HMF
1	Santa Fe Way between Burbank Street and 7th Standard Road	1/1	Undivided	8,142	9,342	A	B

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
HMF = heavy maintenance facility
LOS level of service

Study Intersections

Figure 5.4-44 illustrates the peak-hour turning movements at the study intersections under Existing plus HMF Conditions. Table 5.4-23 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). As illustrated in Table 5.4-23, none of the study intersections are projected to be substantially impacted by the proposed HMF. Figure 5.4-45 illustrates the level of service at the study intersections under Existing plus HMF Conditions.

Table 5.4-23

Existing plus HMF Level-of-Service Summary Analysis for Kern Council of Governments–Shafter HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Santa Fe Way/Burbank Street	Two-Way Stop	15.9	C	20.3	C		15.3	C	19.5	C	
2	Santa Fe Way/Galpin	Signalized	5.5	A	5.5	A		5.3	A	5.2	A	

Note: Delay time is reported in seconds.

Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service

E. FUTURE NO-BUILD (YEAR 2035) CONDITIONS

Level-of-service analysis at the study intersections and roadway segments was conducted for Future No-Build (Year 2035) Conditions to establish a base to evaluate the impacts due to the addition of traffic from the proposed HMF. Future No-Build traffic demands were projected based on Counties of Fresno, Kern and Kings Travel Demand Regional Models. The regional travel demand models included the future transportation improvements that are funded and included in the RTIP (RTIP projects in Fresno, Kings/Tulare, and Bakersfield areas are listed in Sections 4.2.5, 4.3.5, and 4.4.5, respectively, of this document). Intersection and roadway segment analysis for Future No-Build was conducted taking into account the transportation improvements included in the RTIP. Peak-hour turning-movement volumes at the study intersections were projected by application of the Furness procedure using TurnsW32.

Figures 5.4-46 through 5.4-49 illustrate the average daily traffic along the study roadway segments and the number of lanes for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively, under Future No-Build (Year 2035) Conditions. Figures 5.4-50 through 5.4-53 illustrate the projected peak-hour turning movements at the study intersections for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively, under Future No-Build (Year 2035) Conditions. Figures 5.4-54 through 5.4-57 illustrate the level of service at the study intersections for the Fresno, Hanford, Wasco, and Shafter HMF site alternatives, respectively, under Future No-Build (Year 2035) Conditions. Detailed level-of-service calculations are provided in Appendix E (No-Build Synchro Output).

Fresno Works–Fresno HMF Site

Table 5.4-24 summarizes the roadway segment analysis for the Fresno Works–Fresno HMF site.

Table 5.4-24
No-Build Roadway Segment Analysis: Fresno Works–Fresno HMF Site

No.	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	Central Ave., between S. Cedar Ave. and S. Maple Ave.	2/2	Undivided	5,497	D
2	E. American Ave., between S. Cedar Ave. and S. Chestnut Ave.	2/2 till Maple then 1/1 after	Undivided	1,289	C
3	E. Adams Ave. between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	2,393	C

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
NE = northeast
SW = southwest

As illustrated in Table 5.4-24, all roadway segments under Future No-Build Conditions operate at acceptable LOS.

Table 5.4-25 summarizes the intersection analysis for the Fresno Works–Fresno HMF site.

Table 5.4-25
No-Build Intersection Analysis: Fresno Works–Fresno HMF Site

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Cedar Ave./E. Central Ave.	All-Way Stop	12.6	B	285.2	F
2	SR 99 SB Off-Ramp/E. Central Ave.	One-Way Stop	366.2	F	308.2	F
3	SR 99 NB On-Ramp/E. Central Ave.	Free (Yield)	1.4	A	3.5	A
4	SR 99 NB Off-Ramp/S. Chestnut Ave.	One-Way Stop	389.6	F	180.8	F
5	SR 99 SB On-Ramp/S. Chestnut Ave.	Free (Yield)	7.1	A	14.1	B
6	SR 99 SB Off-Ramp/E. American Ave.	One-Way Stop	16.1	C	274.8	F
7	SR 99 NB On-Ramp/E. American Ave.	Free (Yield)	1.4	A	3.1	A
8	Chestnut Ave./Adams Ave.	All-Way Stop	8.9	A	15.3	C
9	SR 99 SB Off-Ramp/Clayton Ave.	One-Way Stop	9.0	A	10.6	B
10	Clovis Ave./SR 99 NB off-ramp	One-Way Stop	22.8	C	19.8	C
11	Clovis Ave./SR 99 SB on-ramp	One-Way Stop	747.4	F	*	F

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Note: Delay time is reported in seconds.
Acronyms:
HMF = heavy maintenance facility
LOS = level of service
NB = northbound
SB = southbound
SR = State Route

As illustrated in Table 5.4-25, all intersections under Future No-Build Conditions operate at acceptable LOS, except the following intersections:

- Cedar Avenue/E. Central Avenue
- SR 99 southbound off-ramp/E. Central Avenue
- SR 99 northbound off-ramp/S. Chestnut Avenue
- SR 99 southbound off-ramp/E. American Avenue
- Clovis Avenue/SR 99 southbound on-ramp

Kings County–Hanford HMF Site

Table 5.4-26 summarizes the roadway segment analysis for the Kings County–Hanford HMF site.

Table 5.4-26
No-Build Roadway Segment Analysis: Kings County–Hanford HMF Site

No.	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	SR 43 between SR 198 and Houston Ave.	1/1	Undivided	14,733	E
2	SR 43 between Houston Ave. and Idaho Ave.	1/1	Undivided	11,746	D
3	Houston Ave. between SR 43 and 7th Ave.	1/1	Undivided	2,848	C
4	Idaho Ave. between SR 43 and 7th Ave.	1/1	Undivided	270	C

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
NE = northeast
SR = State Route
SW = southwest

As illustrated in Table 5.4-26, all roadway segments under Future No-Build Conditions operate at acceptable LOS, except the following roadway segment:

- SR 43 between SR 198 and Houston Avenue

Table 5.4-27 summarizes the intersection analysis for Kings County–Hanford HMF site.

Table 5.4-27
No-Build Intersection Analysis: Kings County–Hanford HMF Site

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Central Valley Hwy/Houston Ave.	Signalized	26.4	C	48.2	D
2	7th Ave./Houston Ave.	Two-Way Stop	11.1	B	27.6	D
3	Central Valley Hwy/Idaho Ave.	Two-Way Stop	25.2	D	47.9	E
4	7th Ave./Idaho Ave.	Two-Way Stop	10.0	A	13.2	B

Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-27, all intersections under Future No-Build Conditions operate at acceptable LOS, except the following intersection:

- Central Valley Highway/Idaho Avenue

Kern Council of Governments–Wasco HMF Site

Table 5.4-28 summarizes the roadway segment analysis for the Kern Council of Governments–Wasco HMF site.

Table 5.4-28
No-Build Roadway Segment Analysis: Kern Council of Governments–Wasco HMF Site

No.	Roadway Segment	# of Lanes (NE/SW)	Divided Undivided	ADT	LOS
1	SR 43, North of SR 46	1/1	Undivided	9,920	B
2	SR 46, between F St. and Wasco Ave.	2/2	Undivided	17,408	A
3	SR 46, East of Wasco Ave.	1/1	Undivided	9,836	B
4	Wasco Ave., between SR 46 and 6th St.	1/1	Undivided	7,608	A

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
NE = northeast
SR = State Route
SW = southwest

As illustrated in Table 5.4-28, all roadway segments under Future No-Build Conditions operate at acceptable LOS.

Table 5.4-29 summarizes the intersection analysis for the Kern Council of Governments–Wasco HMF site.

Table 5.4-29
No-Build Intersection Analysis: Kern Council of Governments–Wasco HMF Site

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Wasco Ave./Paso Robles Hwy.	Two-Way Stop	*	F	*	F
2	Wasco Ave./6th St.	Two-Way Stop	14.5	B	18.4	C

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Note: Delay time is reported in seconds.
Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-29, the intersections under Future No-Build Conditions operate at acceptable LOS, except the following intersection:

- Wasco Avenue/Paso Robles Highway

Kern Council of Governments–Shafter HMF Site

Table 5.4-30 summarizes the roadway segment analysis for the Kern Council of Governments–Shafter HMF sites.

Table 5.4-30
No-Build Roadway Segment Analysis: Kern Council of Governments–Shafter HMF Sites

No.	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	Santa Fe Way between Burbank St. and 7th Standard Rd.	1/1	Undivided	25,098	F

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service
NE = northeast
SW = southwest

As illustrated in Table 5.4-30, the above roadway segment under Future No-Build Conditions operates at unacceptable LOS.

Table 5.4-31 summarizes the intersection analysis for the Kern Council of Governments–Shafter HMF sites.

Table 5.4-31
No-Build Intersection Analysis: Kern Council of Governments–Shafter HMF Sites

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Santa Fe Way/Burbank Street	Two-Way Stop	484.7	F	62.1	F
2	Santa Fe Way/Galpin	Signalized	13	B	19.1	B

Acronyms:
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-31, the intersections under Future No-Build Conditions operate at acceptable LOS, except the following intersection:

- Santa Fe Way/Burbank Street

F. FUTURE (YEAR 2035) WITH HMF CONDITIONS

Level-of-service analysis at the study intersections and roadway segments was conducted for Future (Year 2035) with HMF Conditions to evaluate the impacts at the roadway segments and study intersections due to the addition of traffic from the proposed HMF.

The boundaries of each of the HMF study areas were individually defined based on the potential for impacts on roadway segments and at intersections from the addition of new traffic. The roads and intersections are shown on each of the figures included in this section.

Fresno Works–Fresno HMF Site

Study Roadway Segments

Figure 5.4-58 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future plus HMF Conditions. Table 5.4-32 summarizes the results of the level-of-service analysis for the roadway segments under Future plus HMF Conditions. As

illustrated in Table 5.4-32, none of the roadway segments are projected to be substantially impacted by the HMF.

Table 5.4-32
Future plus HMF Roadway Segments Level-of-Service Summary Analysis for Fresno Works–Fresno HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No HMF)	Future plus HMF	Future (No HMF)	Future plus HMF
1	Central Ave. between S. Cedar Ave. and S. Maple Ave.	2/2	Undivided	5,497	6,087	D	D
2	E. American Ave. between S. Cedar Ave. and S. Chestnut Ave.	2/2 until Maple then 1/1 after	Undivided	1,289	2,559	C	C
3	E. Adams Ave. between S. Cedar Ave. and S. Chestnut Ave.	1/1	Undivided	2,393	2,393	C	C

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
HMF = heavy maintenance facility
LOS = level of service
SR = State Route

Study Intersections

Figure 5.4-59 illustrates the peak-hour turning movements at the study intersections under Future plus HMF Conditions. Table 5.4-33 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-33, five of the study intersections projected to operate at LOS E or F under Future No-Build Conditions are projected to continue to operate at LOS E or F. Figure 5.4-60 illustrates the level of service at the study intersections under Future plus HMF Conditions. The following three study intersections are projected to be substantially impacted by the proposed HMF.

- SR 99 southbound off-ramp/E. Central Avenue
- SR 99 southbound off-ramp/E. American Avenue
- Clovis Avenue/SR 99 southbound on-ramp

Table 5.4-33
Future plus HMF Level-of-Service Summary Analysis for Fresno Works–Fresno HMF Area Study Intersections

Int. ID	Intersection	Control	Future No HMF AM Peak Delay	Future No HMF AM Peak LOS	Future plus HMF Conditions AM Peak Delay	Future plus HMF Conditions AM Peak LOS	Increase in Delay	Future No HMF PM Peak Delay	Future No HMF PM Peak LOS	Future plus HMF Conditions PM Peak Delay	Future plus HMF Conditions PM Peak LOS	Increase in Delay
1	Cedar Ave./E. Central Ave.	All-Way Stop	12.6	B	12.7	B		285.2	F	287.5	F	
2	SR 99 SB Off-Ramp/E. Central Ave.	One-Way Stop	366.2	F	422.9	F	56.7	308.2	F	366.6	F	58.4
3	SR 99 NB On-Ramp/E. Central Ave.	Free (Yield)	1.4	A	1.8	A		3.5	A	3.9	A	
4	SR 99 NB Off-Ramp/S. Chestnut Ave.	One-Way Stop	389.6	F	389.6	F		180.8	F	180.8	F	
5	SR 99 SB On-Ramp/S. Chestnut Ave.	Free (Yield)	7.1	A	7.1	A		14.1	B	14.1	B	
6	SR 99 SB Off-Ramp/E. American Ave.	One-Way Stop	16.1	C	17.7	C	1.6	274.8	F	335.5	F	60.7
7	SR 99 NB On-Ramp/E. American Ave.	Free (Yield)	1.4	A	2.3	A		3.1	A	4.6	A	
8	Chestnut Ave./Adams Ave.	All-Way Stop	8.9	A	8.9	A		15.3	C	15.3	C	
9	SR 99 SB Off-Ramp/Clayton Ave.	One-Way Stop	9.0	A	9.1	A		10.6	B	11.1	B	
10	Clovis Ave./SR 99 NB Off-Ramp	One-Way Stop	22.8	C	27.3	D		19.8	C	23.7	C	
11	Clovis Ave./SR 99 SB On-Ramp	One-Way Stop	747.4	F	*	F	*	*	F	*	F	*

Note:
* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Delay time is reported in seconds.
Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS = level of service
NB – northbound
SB = southbound

Kings County–Hanford HMF Site

Study Roadway Segments

Figure 5.4-61 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future plus HMF Conditions. Table 5.4-34 summarizes the results of the level-of-service analysis for the roadway segments under Future plus HMF Conditions. As illustrated in Table 5.4-34, one roadway segment projected to operate at LOS E or F under No-Build Conditions, is projected to continue to operate at LOS E or F. The following roadway segment is projected to be substantially impacted by the proposed HMF:

- SR 43, between SR 198 and Houston Avenue.

Table 5.4-34
Future plus HMF Roadway Segments Level-of-Service Summary Analysis for Kings County–Hanford HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No HMF)	Future plus HMF	Future (No HMF)	Future plus HMF
1	SR 43, between SR 198 and Houston Ave.	1/1	Undivided	14,733	15,843	E	F
2	SR 43, between Houston Ave, and Idaho Ave.	1/1	Undivided	11,746	12,776	D	D
3	Houston Ave., between SR 43 and 7th Ave.	1/1	Undivided	2,848	3,328	C	C
4	Idaho Ave., between SR 43 and 7th Ave.	1/1	Undivided	270	520	C	C

Source: Data collected by URS in 2010.

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).

ADT average daily traffic
LOS level of service
SR State Route

Study Intersections

Figure 5.4-62 illustrates the peak-hour turning movements at the study intersections under Future plus HMF Conditions. Table 5.4-35 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-35, one of the study intersections projected to operate at LOS E or F under Future No-Build Conditions is projected to continue to operate at LOS E or F. Figure 5.4-63 illustrates the level of service at the study intersections under Future plus HMF Conditions. The following two study intersections are projected to be substantially impacted by the proposed HMF:

- Central Valley Highway/Houston Avenue
- Central Valley Highway/Idaho Avenue

Table 5.4-35
Future plus HMF Level-of-Service Summary Analysis for Kings County–Hanford HMF Area Study Intersections

Int. ID	Intersection	Control	Future No HMF		Future plus HMF Conditions		Increase in Delay	Future No HMF		Future plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Central Valley Hwy./ Houston Ave.	Signalized	26.4	C	38.1	D		48.2	D	65.8	E	17.6
2	7th Ave./Houston Ave.	Two-Way Stop	11.1	B	11.2	B		27.6	D	29.7	D	
3	Central Valley Hwy/ Idaho Ave.	Two-Way Stop	25.2	D	30.7	D		47.9	E	84.8	F	36.9
4	7th Ave./Idaho Ave.	Two-Way Stop	10.0	A	10	A		13.2	B	13.2	B	

Note: Delay time is reported in seconds.
Acronyms:
HMF = heavy maintenance facility
Int. = intersection
Hwy = highway
LOS = level of service

Kern Council of Governments–Wasco HMF Site

Study Roadway Segments

Figure 5.4-64 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future plus HMF Conditions. Table 5.4-36 summarizes the results of the level-of-service analysis for the roadway segments under Future plus HMF Conditions. As illustrated in Table 5.4-36, none of the roadway segments is projected to be substantially impacted by the HMF.

Table 5.4-36
Future plus HMF Roadway Segments Level-of-Service Summary Analysis for Kern Council of Governments–Wasco HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No HMF)	Future plus HMF	Future (No HMF)	Future plus HMF
1	SR 43, North of SR 46	1/1	Undivided	9,920	10,850	B	C
2	SR 46, between F St. and Wasco Ave.	2/2	Undivided	17,408	18,488	A	B
3	SR 46, East of Wasco Ave.	1/1	Undivided	9,836	10,556	B	B
4	Wasco Ave., between SR 46 and 6th St.	1/1	Undivided	7,608	8,898	A	A

Source: Data collected by URS in 2010.

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).

HMF = heavy maintenance facility
LOS = level of service
SR = State Route

Study Intersections

Figure 5.4-65 illustrates the peak-hour turning movements at the study intersections under Future plus HMF Conditions. Table 5.4-37 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-37, one of the study intersections projected to operate at LOS E or F under Future No-Build Conditions is projected to operate at LOS E or F. The following study intersection is projected to be substantially impacted by the proposed HMF. Figure 5.4-66 illustrates the level of service at the study intersections under Future plus HMF Conditions.

- Wasco Ave./Paso Robles Hwy

Table 5.4-37
Future plus HMF Level-of-Service Summary Analysis for Kern Council of Governments–Wasco HMF Area Study Intersections

Int. ID	Intersection	Control	Existing No HMF		Existing plus HMF Conditions		Increase in Delay	Existing No HMF		Existing plus HMF Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Wasco Ave./Paso Robles Hwy.	Two-Way Stop	*	F	*	F	*	*	F	*	F	*
2	Wasco Ave./6th St.	Two-Way Stop	14.5	B	15.3	C		18.4	C	19.7	C	

Note: Delay time is reported in seconds.
* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
Acronyms:
HMF = heavy maintenance facility
Hwy = highway
Int. = intersection
LOS = level of service

Kern Council of Governments–Shafter HMF Site

Study Roadway Segments

Figure 5.4-67 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future plus HMF Conditions. Table 5.4-38 summarizes the results of the level-of-service analysis for the roadway segments under Future plus HMF Conditions. As illustrated in Table 5.4-38, the roadway segment on Santa Fe Way between Burbank Street and 7th Standard Road projected to operate at LOS E or F under Future No-Build Conditions is projected to continue to operate at LOS E or F under Future plus HMF Conditions, and is substantially impacted by the HMF.

Table 5.4-38
Future plus HMF Roadway Segments Level-of-Service Summary Analysis for Kern Council of Governments–Shafter HMF Area

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No HMF)	Future plus HMF	Future (No HMF)	Future plus HMF
1	Santa Fe Way between Burbank St. and 7th Standard Rd.	1/1	Undivided	25,098	26,298	F	F

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronyms:
HMF = heavy maintenance facility
LOS level of service

Study Intersections

Figure 5.4-68 illustrates the peak-hour turning movements at the study intersections under Future plus HMF Conditions. Table 5.4-39 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-39, one of the study intersections projected to operate at LOS E or F under Future No-Build Conditions is projected to operate at LOS E or F under Future plus HMF Conditions. The following study intersection is projected to be substantially impacted by the proposed HMF. Figure 5.4-69 illustrates the level of service at the study intersections under Future plus HMF Conditions.

- Santa Fe Way Burbank Street

Table 5.4-39
Future plus HMF Level-of-Service Summary Analysis for Kern Council of Governments–Shafter HMF Area Study Intersections

Int. ID	Intersection	Control	Future No HMF AM Peak Delay	Future No HMF AM Peak LOS	Future plus HMF Conditions AM Peak Delay	Future plus HMF Conditions AM Peak LOS	Increase in Delay	Future No HMF PM Peak Delay	Future No HMF PM Peak LOS	Future plus HMF Conditions PM Peak Delay	Future plus HMF Conditions PM Peak LOS	Increase in Delay
1	Santa Fe Way/Burbank Street	Two-Way Stop	484.7	F	*	F	*	62.1	F	520.9	F	458.8
2	Santa Fe Way/Galpin	Signalized	13.0	B	14.8	B		19.1	B	23.1	C	

Note: Delay time is reported in seconds.

* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.

Acronyms:
HMF = heavy maintenance facility
Int. = intersection
LOS level of service

5.4.5 Proposed Roadway Closures

The HST requires an exclusive right-of-way within which trains can operate without any potential for delay or collision with local or regional surface street traffic. Along many segments, the HST will be elevated which, once constructed, will allow relatively unimpeded access under the tracks. The following summarizes road closures that will change existing access.

Along the BNSF Alternative Alignment, 38 local roads would be closed and traffic diverted to adjacent road

The following road closures are currently proposed at the HST right-of-way:

- Kern Street, Fresno County
- Mono Street, Fresno County
- E. California Street, Fresno County
- S. Cherry Avenue, Fresno County
- S. Railroad Avenue, Fresno County
- E. Lorena Avenue, Fresno County
- S. Van Ness Avenue, Fresno County
- E. Florence Avenue, Fresno County
- S. Sarah Avenue, Fresno County
- E. Belgravia Avenue, Fresno County
- S. East Avenue, Fresno County
- S. Orange Avenue, Fresno County
- E. Malaga Avenue, Fresno County
- E. Jefferson Avenue, Fresno County
- E. Morton Avenue, Fresno County
- E. Sumner Avenue, Fresno County
- E. Dinuba Avenue, Fresno County
- E. Rose Avenue, Fresno County
- E. Kamm Avenue, Fresno County
- S. Willow Avenue, Fresno County
- E. Clarkson Avenue, Fresno County
- S. Minnewawa Avenue, Fresno County
- Ninth Avenue, Kings County
- North Avenue, Kings County
- Douglas Avenue, Kings County
- Jersey Avenue, Kings County
- Brokaw Avenue, Kings County
- Sherman Avenue, Kings County
- Avenue 136, Rural Tulare County
- Angiola Drive, Tulare County
- Palmer Avenue, Tulare County
- Pond Road, Kern County
- Blankenship Avenue, Kern County
- Taussig Avenue, Kern County
- Wasco Avenue, Kern County
- Madera Avenue, Kern County
- Mettler Avenue, Kern County
- F Street, Kern County

Along the Corcoran Elevated Alternative Alignment, 3 local roads would be closed and traffic diverted to adjacent road:

- Jersey Avenue, Corcoran, Kings County
- Santa Fe Avenue, Corcoran, Kings County
- Avenue 136, Rural Tulare County

Along the Corcoran Bypass Alternative Alignment, 10 local roads would be closed and traffic diverted to adjacent road:

- Jersey Avenue, Corcoran, Kings County
- Newark Avenue, Corcoran, Kings County
- Niles Avenue, Corcoran, Kings County
- Fifth Avenue, Corcoran, Kings County
- Orange Avenue, Corcoran, Kings County
- 4-1/2 Avenue, Corcoran, Kings County
- Oregon Avenue, Corcoran, Kings County
- Avenue 156, Corcoran, Kings County
- Avenue 152, Corcoran, Kings County
- Avenue 136, Rural Tulare County

Along the Allensworth Bypass Alternative Alignment, two local roads would be closed and traffic diverted to adjacent road:

- Woollomes Avenue, Rural Kern County
- Elmo Highway, Rural Kern County

Along the Wasco-Shafter Bypass Alternative Alignment, 18 local roads would be closed and traffic diverted to adjacent road:

- McCombs Avenue, Wasco, Kern County
- Gromer Avenue, Wasco, Kern County
- Sixth Street, Wasco, Kern County
- Root Avenue, Wasco, Kern County
- Poso Avenue, Wasco, Kern County
- Filburn Avenue, Wasco, Kern County
- Jackson Avenue, Wasco, Kern County
- Dresser Avenue, Rural Kern County
- Jack Avenue, Shafter, Kern County
- Mannel Avenue, Shafter, Kern County
- Merced Avenue, Shafter, Kern County
- Madera Avenue, Shafter, Kern County
- Fresno Avenue, Shafter, Kern County
- E. Tulare Avenue, Shafter, Kern County
- Los Angeles Street, Shafter, Kern County
- Orange Street, Rural Kern County
- Burbank Street, Rural Kern County
- Mendota Street, Rural Kern County

Along the Bakersfield South Alternative Alignment, three local roads would be closed and traffic diverted to adjacent road:

- Two unnamed alleys, Bakersfield, Kern County
- Hayden Court, Bakersfield, Kern County
- Butte Street, Bakersfield, Kern County

There may be potential impacts associated with property access as a result of the closures above depending on the availability of alternative access routes. Because of potential property access issues, the road closure impacts are considered to be moderate under NEPA and significant under CEQA.

5.4.6 City of Corcoran Roadway Closure Analysis

Figure 5.4-70 illustrates the Corcoran study intersections.

A. EXISTING CONDITIONS

Figure 5.4-71 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Existing Conditions. Table 5.4-40 summarizes the roadway segment analysis for Corcoran.

Table 5.4-40
Existing Roadway Segment Analysis: Corcoran

No.	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	Brokaw Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	1,700	C
2	Pickerell Ave., between SR 43 and Whitley Ave.	1/1	Undivided	1,082	C
3	Whitley Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	5,504	D
4	Sherman Ave., west of Santa Fe Ave.	1/1	Undivided	2,590	C

Acronyms:
ADT = average daily traffic
LOS = level of service
NE = northeast
SW = southwest

As illustrated in Table 5.4-40, all roadway segments under existing conditions operate at acceptable LOS.

Figures 5.4-72 and 5.4-73 illustrate the lane geometries and turning-movement volumes, respectively, at the intersections for Existing Conditions. Table 5.4-41 summarizes the intersection analysis for the Corcoran area. Detailed level-of-service calculations are provided in Appendix B (Existing Synchro Output).

Table 5.4-41
Existing Intersection Analysis: Corcoran

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Brokaw Ave./Chittenden Ave.	Two-Way Stop	9.7	A	10.3	B
2	Whitley Ave./Chittenden Ave.	Two-Way Stop	11.1	B	14.0	B
3	Whitley Ave./Pickerell Ave.	Two-Way Stop	9.9	A	10.5	B
4	Sherman Ave./Santa Fe Ave.	One-Way Stop	9.3	A	9.5	A

Acronyms:
Int. = intersection; LOS = level of service

As illustrated in Table 5.4-41, all intersections under existing conditions operate at acceptable LOS.

B. EXISTING PLUS PROJECT CONDITIONS

Study Roadway Segments

Figure 5.4-74 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Existing plus Project Conditions. Table 5.4-42 summarizes the results of the level-of-service analysis for the roadway segments under Existing plus Project Conditions.

As illustrated in Table 5.4-42, none of the roadway segments are projected to be substantially impacted by the HMF.

Table 5.4-42
Existing plus Project Roadway Segments Level-of-Service Summary Analysis for Corcoran

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Existing (No Project)	Existing plus Project	Existing (No Project)	Existing plus Project
1	Brokaw Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	1,700	1,700	C	C
2	Pickerell Ave., between SR 43 and Whitley Ave.	1/1	Undivided	1,082	1,082	C	C
3	Whitley Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	5,504	6,800	D	D
4	Sherman Ave., west of Santa Fe Ave.	1/1	Undivided	2,590	518	C	C

Source: Data collected by URS in 2010.

Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).

ADT average daily traffic
LOS level of service
SR State Route

Study Intersections

Figure 5.4-75 illustrates the peak-hour turning movements at the study intersections under Existing plus Project Conditions. Table 5.4-43 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix D (Existing plus Project Synchro Output). As illustrated in Table 5.4-43, none of the study intersections is projected to be substantially impacted by the proposed project.

Table 5.4-43
Existing plus Project Level-of-Service Summary Analysis for Corcoran Study Intersections

Int. ID	Intersection	Control	Existing No Project		Existing plus Project Conditions		Increase in Delay	Existing No Project		Existing plus Project Conditions		Increase in Delay
			AM Peak		AM Peak			PM Peak		PM Peak		
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS	
1	Brokaw Ave./Chittenden Ave.	Two-Way Stop	9.7	A	8.7	A		10.3	B	8.8	A	
2	Whitley Ave./Chittenden Ave.	Two-Way Stop	11.1	B	11.6	B		14.0	B	13.7	B	
3	Whitley Ave./Pickerell Ave.	Two-Way Stop	9.9	A	11.6	B		10.5	B	13.3	B	
4	Sherman Ave./Santa Fe Ave.	One-Way Stop	9.3	A	8.4	A		9.5	A	8.4	A	

Note: Delay time is reported in seconds.

Acronyms:
Int. = intersection
LOS = level of service

C. FUTURE NO-BUILD CONDITIONS

Figure 5.4-76 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future No-Build Conditions. Table 5.4-44 summarizes the roadway segment analysis for Corcoran.

Table 5.4-44
No-Build Roadway Segment Analysis: Corcoran

No.	Roadway Segment	# of Lanes (NE/SW)	Divided/ Undivided	ADT	LOS
1	Brokaw Ave., between Van Dorsten Ave. and Chittenden Ave.	2/2 until Norboe Ave. then 1/1 until Otis, then 2/2 again	Undivided	2,734	C
2	Pickerell Ave., between SR 43 and Whitley Ave.	1/1	Undivided	5,092	C
3	Whitley Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	7,430	D
4	Sherman Ave., west of Santa Fe Ave.	1/1	Undivided	6,387	D

Acronyms:
ADT = average daily traffic
LOS = level of service
NE = northeast
SW = southwest

As illustrated in Table 5.4-44, all roadway segments under Future No-Build Conditions operate at acceptable LOS.

Figure 5.4-77 illustrates the turning-movement volumes at the intersections for Future No-Build Conditions. Table 5.4-45 summarizes the intersection analysis for the Corcoran area. Detailed level-of-service calculations are provided in Appendix E (No-Build Synchro Output).

Table 5.4-45
No-Build Intersection Analysis: Corcoran

Int. ID	Intersection	Control Type	AM		PM	
			Delay	LOS	Delay	LOS
1	Brokaw Ave./Chittenden Ave.	Two-Way Stop	9.7	A	10.1	B
2	Whitley Ave./Chittenden Ave.	Two-Way Stop	10.5	B	15.6	C
3	Whitley Ave./Pickerell Ave.	Two-Way Stop	13.6	B	19.0	C
4	Sherman Ave./Santa Fe Ave.	One-Way Stop	13.6	B	40.7	E

Acronyms:
Int. = intersection
LOS = level of service

As illustrated in Table 5.4-45, all intersections under Future No-Build Conditions operate at acceptable LOS, except the following intersection:

- Sherman Avenue/Santa Fe Avenue

D. FUTURE PLUS PROJECT CONDITIONS

Study Roadway Segments

Figure 5.4-78 illustrates the projected average daily traffic along the roadway segments and the number of lanes for Future plus Project Conditions. Table 5.4-46 summarizes the results of the level-of-service analysis for the roadway segments under Future plus Project Conditions. As illustrated in Table 5.4-46, none of the roadway segments are projected to be substantially impacted by the proposed project.

Table 5.4-46
Future plus Project Roadway Segments Level-of-Service Summary Analysis for Corcoran

No.	Roadway Segment	Number of Lanes	Divided/ Undivided	Average Daily Traffic		LOS	
				Future (No Project)	Future plus Project	Future (No Project)	Future plus Project
1	Brokaw Ave., between Van Dorsten Ave. and Chittenden Ave.	2/2 until Norboe Ave. then 1/1 until Otis, then 2/2 again	Undivided	2,734	2,734	C	C
2	Pickerell Ave., between SR 43 and Whitley Ave.	1/1	Undivided	5,092	5,092	C	C
3	Whitley Ave., between Van Dorsten Ave. and Chittenden Ave.	1/1	Undivided	7,430	10,624	D	D
4	Sherman Ave., west of Santa Fe Ave.	1/1	Undivided	6,387	1,278	D	C

Source: Data collected by URS in 2010.
Note: LOS is based on Florida tables (State of Florida Department of Transportation 2002).
Acronym:
LOS = level of service

Study Intersections

Figure 5.4-79 illustrates the peak-hour turning movements at the study intersections under Future plus Project Conditions. Table 5.4-47 summarizes the results of the level-of-service analysis for the study intersections. Detailed level-of-service calculations are provided in Appendix F (Future plus Project Synchro Output). As illustrated in Table 5.4-47, one study intersection is projected to be substantially impacted by the proposed project:

- Whitley Avenue/Pickerell Avenue

Table 5.4-47
Future plus Project Level-of-Service Summary Analysis for Corcoran Area Study Intersections

Int. ID	Intersection	Control	Future No Project AM Peak Delay	Future No Project AM Peak LOS	Future plus Project Conditions AM Peak Delay	Future plus Project Conditions AM Peak LOS	Increase in Delay	Future No Project PM Peak Delay	Future No Project PM Peak LOS	Future plus Project Conditions PM Peak Delay	Future plus Project Conditions PM Peak LOS	Increase in Delay
1	Brokaw Ave./ Chittenden Ave.	Two-Way Stop	9.7	A	9.5	A		10.1	B	8.8	A	
2	Whitley Ave./ Chittenden Ave.	Two-Way Stop	10.5	B	13.5	B		15.6	C	15.2	C	
3	Whitley Ave./ Pickerell Ave.	Two-Way Stop	13.6	B	60.4	F	46.8	19.0	C	*	F	*
4	Sherman Ave./ Santa Fe Ave.	One-Way Stop	13.6	B	8.4	A		40.7	E	8.3	A	

Note: Delay time is reported in seconds.
* = Volumes at the intersection exceed theoretical capacity. As a result, average delay cannot be predicted.
LOS = level of service

5.4.7 Transit

At the proposed stations, the proposed project is projected to add approximately 700 daily passengers to transit service in the city of Fresno and approximately 900 daily passengers to transit service in the city of Bakersfield. It is projected that the proposed project would add approximately 105 peak-hour passengers to the transit service in the city of Fresno and approximately 135 peak-hour passengers in Bakersfield. Existing transit lines do not currently serve the proposed Kings/Tulare Regional Station site as it is in an undeveloped area, but the station design includes a bus transit pullout and loading area to accommodate future transit service. It is further expected that transit providers serving these stations would include the station sites as a stop along the routes that already serve the station area.

The addition of these passengers to the existing transit routes during the peak hour is not expected to have a substantial effect on transit. Approximately eight transit routes serve the Fresno Station area. The addition of approximately 105 passengers on existing transit routes averages approximately 13 additional passengers on each route serving the Fresno Station area, assuming equal distribution.

Under existing conditions, approximately 17 transit routes serve the Bakersfield station area, and the addition of approximately 135 passengers on existing transit routes in the Bakersfield station area averages about 8 additional passengers per route, assuming equal distribution. The existing transit fleet is expected to be able to accommodate the per route increases associated with the BNSF Alternative. Impacts would be less than significant.

5.4.8 Pedestrians

The proposed project would not close any of the existing or planned bicycle routes or pedestrian access/routes in the immediate vicinity of stations. An estimated 400 passengers would access the city of Fresno station area via walking or biking on a daily basis. Approximately 500 passengers would similarly access the city of Bakersfield station area. Approximately 60 passengers during the peak hour in city of Fresno would arrive or leave the station area either by walking or on bicycle, and approximately 75 would do so in the city of Bakersfield. A typical pedestrian sidewalk can accommodate approximately 1,000 persons per hour based on the *Highway Capacity Manual* (Transportation Research Board 2000).

The Kings/Tulare Regional Station is not anticipated to have the same level of demand or use by bicyclists and pedestrians because it is not as close to the community as are the other stations, but it will accommodate both pedestrian and bicycle access. The stations would include bicycle racks, pedestrian connections to the existing sidewalks, and bicycle lanes and facilities where they can be accommodated. The addition of these pedestrian and bike trips during the peak hour (an average of about one pedestrian or bike per minute) in the Fresno and Bakersfield station areas would not substantially affect existing pedestrian and bike facilities. Effects would not be substantial.

5.4.9 Parking

The proposed stations would include passenger drop-off areas (“kiss-and-ride” locations) at the entrances to the station or within the parking area. The station parking areas would accommodate up to approximately 5,000 vehicles at the Fresno Station, 1,600 vehicles at the Kings/Tulare Regional Station, and approximately 4,500 parking spaces at the Bakersfield station. These parking facilities would be designed to accommodate demand and to avoid overflow parking on nearby area streets. Impacts would be less than significant.

5.4.10 Construction Impacts

A. PROPOSED PROJECT

It is projected that approximately 170 peak-hour trips would be added to the transportation infrastructure during construction of the proposed project in the cities of Fresno and Bakersfield. One study intersection within the city of Fresno, four study intersections within the Kings/Tulare Regional Station area, and one study intersection within the city of Bakersfield are projected to be substantially impacted by the proposed project. Because project construction traffic would be temporary, any associated delays are not considered as impacts. The Authority and FRA have considered avoidance and minimization measures consistent with the Statewide and Bay Area to Central Valley Program EIR/EIS commitments. During project design and construction, the Authority and FRA would implement measures to reduce any associated delays on transportation.

The following study intersection in the city of Fresno is projected to be significantly impacted by the addition of construction traffic from the proposed project:

- N. Blackstone Avenue/SR 180 westbound ramps

The following study intersections in the Kings/Tulare Regional Station area are projected to be significantly impacted by the addition of construction traffic from the proposed project:

- Seventh Street/SR 198
- Sixth Street/SR 198
- Second Avenue/SR 198
- SR 43/Lacey Boulevard

The following study intersection in the city of Bakersfield is projected to be significantly impacted by the addition of construction traffic from the proposed project:

- S. Union Avenue/Eastbound SR 58 ramps

The figure showing Construction Trips and Synchro Output for the construction-phase analysis is provided in Appendix I (Construction Scenario–Trips and Synchro Output).

B. HEAVY MAINTENANCE FACILITY SITE ALTERNATIVES

Impacts on roadways at the HMF facilities during construction would be temporary but potentially significant at times. Worker vehicles entering and leaving the job sites at the beginning and end of shifts have the potential to change levels of service and cause delays on roadways and at intersections similar to those identified for the proposed project. Heavy equipment and the delivery and removal of materials by trucks also have the potential to affect local traffic levels of service, especially if the material delivery or removal occurs during peak morning or evening periods. Impacts associated with HMF construction would be potentially significant.

C. CONSTRUCTABILITY ASSESSMENT

This section identifies possible locations for Precast Operations Yards, Construction Staging Areas, and Construction Laydown Areas for the Fresno to Bakersfield segment of the California HST project. Impacts that these locations may have on construction and some of the impacts that these facilities may have on neighboring areas, such as noise, pollution, and traffic disruption, are also identified.

The Precast Operations Yards would allow mass production of precast concrete sections that would be assembled into viaducts. Approximately 25 miles of viaduct would be precast in sections

in these yards, and the sections would then be transported to the sites and erected. The Precast Operations Yards are near extended lengths of precast viaduct—the locations are strategically chosen to minimize distances between the Precast Operation Yards and the locations of erection. Rural locations are desirable for precast sites; these facilities will not be aesthetically pleasing, nor will they be quiet.

The Construction Staging Areas would house incoming materials; provide areas for material preparation, storage of equipment, maintenance of equipment, operations preparation, and construction offices; and would allow good housekeeping throughout the alignment. Haphazard staging of materials and equipment throughout the alignment would not be conducive to the construction process and is not normal practice. Preliminary locations for Construction Staging Areas would be placed in regular intervals along the HST route. The locations are meant to be low maintenance and out of the public's way. Each site would regularly and frequently receive materials and equipment; therefore, proximity to main roads and direct access to construction side roads and arterial roads are important for reducing the impact on the general flow of traffic.

The Construction Laydown Areas would be used to construct the steel truss structures over S. Golden State Boulevard and over the Pearl Harbor Survivors Memorial (SR 99) in Fresno, and over Cole Slough, Dutch John Cut, and Kings River between Kingsburg and Hanford. These areas would be required for a shorter period than the Construction Staging Areas would be.

5.4.11 Sites for Precast Operations Yards

A. CRITERIA

Because of the length of viaduct for which large precast sections would be used (approximately 25 miles), the fabrication sites must be chosen carefully. The efficiency of production of the large precast members is greatly affected by the site selection. The site selection can affect the length of time to fabricate the sections and the time and the cost to transport and erect precast members.

The benefits of good access to existing utilities are reduced construction-site development time and reduced costs. Minimizing impacts on average daily traffic is a main consideration in the selection of suitable sites. Where traffic impacts are foreseen, the contractor should put in place a location-specific, activity-based trip schedule to minimize those impacts. Accessibility to these sites is a key factor for efficient rates of production. Sites must meet the minimum area requirements because the amount of available space affects the production schedule, especially for the precast structural sections. The following five criteria are guidelines for choosing Precast Operation Yards; the locations discussed in this document would meet these minimum criteria.

Utilities

The precasting facilities would require a full range of standard utilities, including communications, power, potable and industrial water, drainage, and sewer. Ideally, existing utilities would have sufficient capacity. In the event they are insufficient, the site selection would consider the proximity of existing utility connections.

Overlap of the temporary facilities with later permanent support installations would be cost-effective. For example, an HMF or maintenance-of-way facility would provide ample utility service improvements that could be reused; such improvements could include building foundations and slabs, offices, parking improvements, fencing, and security.

Traffic

Site selection should minimize interference with pedestrians, bicyclists, and transit (including automobile traffic); however, selected areas would require direct access to arterials from major highways. Direct access to the HST right-of-way would afford direct transport of the precast sections to their erection sites with minimal impacts on traffic.

The load and volume capacities of existing roads and structures must withstand the increased loads and traffic volume from construction operations. If existing roads and structures were to be used to access erection sites or casting yards, an analysis of these structures would need to be undertaken upon further development of site selection. Similarly, site-specific investigations on horizontal and vertical clearances and on existing geometric road conditions, as they pertain to construction equipment mobility and transport, would need to be undertaken.

Area

A minimum of 16 acres would be needed for casting operations. Additional areas would be necessary for equipment storage, maintenance yard, shipping and receiving of materials, and possibly for precast storage. Detailed quantities have not been set for the additional areas, but 40 to 50 total acres for all activities should be sufficient.

Location

Proposed Precast Operation Yards should be close to where the precast sections would be erected to minimize the distances that the large precast sections would be transported. Locations within the HST right-of-way would minimize land acquisitions. Floodplains and environmentally sensitive areas should be avoided because they pose an additional risk to the contractor. A minimum offset of 25 feet from existing UPRR and BNSF facilities would be observed for all sites. To reduce the contractor's cost and risk, precast operations should not be in areas that are sensitive to noise or that would restrict working hours.

Accessibility

Locations should be close to major roadways (on- and off-ramps). Direct access to major roadways would aid shipping to and receiving from the Precast Operation Yards and minimize travel on side roads.

B. SITE FPC1

General Location

Site FPC1 is approximately 4.5 miles south of Fresno and is within a proposed HMF area. The site is bounded by E. American Avenue to the north, by S. Cedar Avenue to the west, by the UPRR railroad to the east, and by an unidentified road to the south. The site consists of three parcels of agricultural land. This area would service the F1 alignment.

Feasibility

The land is used for agriculture. The occupants of one dwelling within the area would need to be relocated. Impacts to the area would be a loss of agricultural land and relocation of the current occupants of a single dwelling.

Meets Each Criteria

The traffic volume in this area is assumed to be low because the surrounding areas are made up of agricultural land. There are no floodplains or identified environmentally sensitive areas at this

location. The total area of this site is 98 acres, and it is located along the proposed HST alignment. Site FCP1 is approximately 1.5 miles from SR 99. The proposed access to site FPC1 would be via S. Cedar Avenue from SR 99 southbound and via E. Jefferson Avenue from SR 99 northbound. There are no proposed road closures. FPC1 is in a rural location approximately 4.5 miles from Fresno and has a flat topography; there are no foreseen restrictions on equipment use by horizontal clearances or by existing geometric road conditions. Construction equipment requiring assembly in the staging area would be restricted by the vertical clearance of overhead power lines.

General Size, Shape, and Location

The 98-acre site is rectangular and is in a suitable location for setting up a precasting facility, if one is required near Fresno. The space is adequate to house construction equipment and materials.

Site Summary

This site is adequate in size and location for both precast operations and for staging construction materials and equipment. The extent of viaduct in Fresno is relatively short (1.3 miles), so a precasting facility may not be required. The proposed site is in the HST right-of-way and would provide access to service roads and to construction areas. No businesses would be relocated but residents of one dwelling would need to be relocated.

C. SITE WPC 1

General Location

Site WPC 1 is in the city of Wasco and is bounded by Paso Robles Highway to the north, by Wasco Avenue to the west, by Sixth Avenue to the south, and by a private road about 1,000 feet to the east of Wasco Avenue. This site is a proposed HMF location.

Feasibility

The proposed area is currently used as agricultural land, and an actively used rail yard is in the immediate vicinity; this rail yard may be used for the transportation of materials and equipment. The topography is flat and no parcels of land would need to be purchased if the HMF were located here. The site is close to other businesses and dwellings; this proximity would make noise and dust-control important factors. One factor affecting the feasibility of this site would be the potential increase in the traffic volume of SR 43, which provides access to nearby urban developments.

Meets Each Criteria

Because the site is near a developed urban area, the existing utilities and capacities are presumed to be adequate. However, the utilities would need to be brought approximately 1,000 feet from the urban development to the casting site. Proposed construction access to WPC 1 would be via Wasco Avenue and Sixth Street from north and southbound SR 43, respectively. There are no proposed road closures. Access roads would need to be repaired or refinished upon completion of construction in this location because the wear on the existing roadway elements would be excessive. The site meets the minimum area requirement and has additional work area. The proposed area is near extended sections of precast viaduct. The Precast Operation Yard would be along SR 43, which runs parallel to the proposed viaduct alignment, and the site would provide direct access to construction service roads. The precasting facility would be within the proposed maintenance facility footprint, so additional land acquisitions would not be necessary. No documented environmentally sensitive areas or floodplains are in the immediate area.

General Size, Shape, and Location

The precasting facility would be within the proposed rectangular maintenance facility footprint and would total approximately 49 acres. Site WPC 1 is a favorable option, because the site itself is not densely populated and it is near proposed precast structural sections. Proximity to urban developments is a negative characteristic of this site.

Site Summary

Site WPC 1 is a favorable site because of its proximity to major roads, to sections of precast viaduct, and possibly to rail transport. The area is sufficient in size for the production and storage of precast elements and for support operations. WPC 1 does not encroach on any floodplains or environmentally sensitive areas. No land acquisitions would be necessary in excess of what would be acquired for the proposed maintenance facility. The proximity to urban development needs to be weighed against the favorable aspects of the site.

D. SITE SPC 2-B

General Location

Site SPC 2-B is within a proposed HMF footprint approximately 4.5 miles south of the city of Shafter. The site is bounded by Santa Fe Way/S. Central Valley Highway to the southwest, by S. Burbank Street to the north, and by Driver Avenue to the east. The alignment considered for this site is WS2 (Wasco-Shafter Bypass Alternative from Poplar Avenue to 7th Standard Road).

Feasibility

This site would not require the purchase of land in excess of the proposed HMF footprint. No demolition of structures or relocation of occupants would be required. Construction access would be via Weidenbach Street from southbound Santa Fe Way/S. Central Valley Highway and via Nord Avenue onto Fanucchi Way East from northbound Santa Fe Way/S. Central Valley Highway.

Meets Each Criteria

The site is in an undeveloped area, and utilities would likely need to be brought to the site. There are developments within a mile of SPC 2-B (a Target distribution center), so the necessary utilities would presumably come from about 1 mile away. The site meets the minimum area requirement, has additional work area, and is near extended sections of precast viaduct.

Site SPC 2-B runs parallel to Santa Fe Way/S. Central Valley Highway, a major roadway that would provide favorable access for shipping and receiving of materials. Also, the site is parallel to the HST right-of-way and would allow access to construction side roads. The proposed footprint does not encroach on any documented environmentally sensitive areas.

General Size, Shape, and Location

Site SPC 2-B is approximately 141 acres and is composed of multiple parcels of land. This proposed location is large enough to accommodate both precasting and construction staging.

Site Summary

Site SPC 2-B is favorable in that it is located along the HST right-of-way, is within a proposed HMF footprint, is close to long spans of viaduct and to a major highway, and has adequate workspace for both precasting and construction staging.

E. SITE BPC 2

General Location

Site BPC 2 is in the southeast part of Bakersfield along Edison Highway. The site is bounded by E. California Avenue to the north, by Vansite Street to the west, by Quantico Avenue to the east, and by Potomac Avenue to the south. This is an empty dirt lot surrounded by urban dwellings. The alignments considered for this site are B1 and B2 (BNSF Alternative from 7th Standard Road south of Shafter to Baker Street in Downtown Bakersfield and Bakersfield South Alternative from Rosedale Highway to Baker Street in Downtown Bakersfield, respectively).

Feasibility

Site BPC 2 is in a densely populated urban area. The total area identified would not be available because a setback from the property line would be required because of the existing dwellings. Approximately one third of the identified area is zoned residential, which would restrict the use of this portion to site offices and parking. After the property line setbacks and the residential zoned areas are taken into consideration, the remaining area of 16 acres would meet the minimum requirement for a precasting site. This site would have limited capacity to store precast members and does not provide additional work area.

The operating hours would be regulated and dust control would be very important. The development of an industrial operation in an urban setting would have additional significant negative impacts and therefore would be unfavorable.

Meets Each Criteria

There are no identified floodplains or documented environmentally sensitive areas within the footprint. Existing utilities are likely to be adequate. Access to the BPC 2 site would be via Edison Highway from the north and via Potomac Avenue from the south. There are no proposed road closures. The area is close to extended sections of precast viaduct.

General Size, Shape, and Location

Site BPC 2 is rectangular and equals about 24 acres, with 16 acres available for the casting operation. The surrounding area is a densely populated urban development; therefore, this site is not a favorable option.

Site Summary

Site BPC 2 meets the necessary requirements, but it is not geographically ideal, because it is neither on the outer limits of town nor in a rural area along the HST alignment. The site is smaller than BPC 1 and this would limit the working area. During further development of the construction assessment memo, other optional sites will be explored.

5.4.12 Construction Staging Areas

A. CRITERIA

The following four criteria are the guidelines for the selection of Construction Staging Areas.

Traffic

Sites should be selected with efforts to minimize interference with pedestrians, bicyclists, and transit. Selected areas are to have direct access to arterials from major highways. Direct access to the HST right-of-way affords direct transport of materials and equipment to construction sites

with minimal impacts on traffic. Construction Staging Areas should be located within the same footprint as the Precasting Operations Yards to minimize cost and potential environmental impacts.

The load and volume capacity of existing structures and roads would need to support construction operations. An analysis of these existing roads and structures would be undertaken. Similarly, a site-specific investigation of horizontal and vertical clearances and of existing geometric road conditions, as they pertain to construction equipment mobility and transport, would be undertaken.

Area

A minimum of 80 acres is desirable for operations. In addition to this 80-acre minimum area, the option to add a concrete tie plant would require an additional 50 acres. The sizes of the staging areas depend on the areas available in each location.

Location

Areas should be evenly distributed along the alignment to minimize the distances between construction sites. The staging areas should be spaced 15 to 25 miles apart. Locations within the HST right-of-way would minimize land acquisitions. Floodplains and environmentally sensitive areas should be avoided because they pose an additional risk to the contractor. A minimum offset of 25 feet from existing UPRR and BNSF lines would be observed for all sites.

Accessibility

The locations should be close to major roadways and to on- and off-ramps. Access to major roadways would aid in shipping to and receiving from the construction site and would minimize travel on side roads.

B. SITE CS1

General Location

Site CS1 is in the city of Fresno and is specifically required for the construction of the jacked box under SR 180. The site consists of multiple parcels of urban land, and a large building may need to be displaced. This area would service the F1 alignment (the BNSF Alternative from Amador Street to E. Lincoln Avenue), specifically for the construction under SR 180.

Feasibility

A substantial contractor staging or laydown area would be required for the construction of the jacked box under SR 180. The site identified is approximately 36 acres and should be sufficient for this complex construction.

Meets Each Criteria

This construction staging area does not follow the criteria outlined above because of the specific requirement for a contractor staging area close to the construction under SR 180.

General Size, Shape, and Location

The CS1 site is approximately 36 acres and spans both sides of the SR 180. The unusual shape of the site can best be described as a rectangular area and a triangular area joined at a point just north of SR 180. Divisadero Street bounds the site on the west and south, and the UPRR bounds the site on the east.

Site Summary

This site is adequate in size and location for staging construction materials and equipment specifically for the complex construction under SR 180.

C. SITE CS2

General Location

Site CS2 is approximately 4.5 miles south of Fresno and is within a proposed HMF area. The site is bounded by E. American Avenue to the north, by S. Cedar Avenue to the west, by the UPRR railroad to the east, and by an unidentified road to the south. The site consists of three parcels of agricultural land. This area would service the F1 alignment.

Feasibility

The land is used for agriculture. The occupants of one dwelling within the area would need to be relocated. Impacts on the area would be a loss of agricultural land and relocation of the current occupants of a single dwelling.

Meets Each Criteria

The traffic volume in this area is assumed to be low because the surrounding areas are made up of agricultural land. There are no floodplains or identified environmentally sensitive areas at this location. The total area of this site is 98 acres, and it is located along the proposed HST alignment. Site CS2 is approximately 1.5 miles from SR 99. The proposed access to site CS2 would be via S. Cedar Avenue from SR 99 southbound and via E. Jefferson Avenue from SR 99 northbound. There are no proposed road closures. CS2 is in a rural location approximately 4.5 miles from Fresno and has a flat topography; there are no foreseen restrictions on equipment use by horizontal clearances or by existing geometric road conditions. Construction equipment requiring assembly in the staging area would be restricted by the vertical clearance of overhead power lines.

General Size, Shape, and Location

The 98-acre site is rectangular and is in an ideal location for staging materials and equipment. The space is adequate to house construction equipment and materials.

Site Summary

This site is adequate in size and location for staging construction materials and equipment. The proposed site is in the HST right-of-way and would provide access to service roads and to construction areas. No businesses would be relocated but residents of one dwelling might need to be relocated.

D. SITE CS4-A

General Location

Site CS4-A is on the eastern border of Hanford. The site is bounded by SR 43 to the west, by E. Lacey Boulevard to the south, by the cross-valley railroad to the north, and by an urban development to the east. An operating BNSF rail yard is directly west of the site. This area would service the H alignment (BNSF Alternative from E. Lincoln Avenue to Idaho Avenue south of Hanford).

Feasibility

This site consists of two parcels of agricultural land with one industrial structure. Impacts to the area would be the loss of agricultural land and the possible relocation of one business. The BNSF railroad might be used for the transportation of materials and equipment to the staging area.

Meets Each Criteria

Site CS4-A is in a rural agricultural area, and should have minimal interference with pedestrians, bicyclists, and transit. The site is immediately west of the HST right-of-way and therefore would allow access to the construction site and to construction roads. SR 198 and SR 43 are each less than 1 mile away, and these highways would provide favorable access for the delivery of materials and equipment to and from the staging site. The proposed site access would be via SR 43, and there are no proposed road closures. The site is approximately 86 acres. The site does not encroach on any floodplains or environmentally sensitive areas.

CS4-A is in a rural location and has a flat topography; there are no foreseen restrictions on equipment use by horizontal clearances or by existing geometric road conditions. Construction equipment requiring assembly in the staging area would be restricted by the vertical clearance of overhead power lines.

General Size, Shape, and Location

The 86-acre site is square and is ideally located for use as a staging area for construction materials and equipment.

Site Summary

Site CS4-A is adequate in size and is located near future construction areas. The site is in the HST right-of-way and would provide access to service roads and to construction areas.

E. SITE CS5

General Location

Site CS5 is approximately 3 miles southeast of Hanford. The site is bounded by Golden State Highway 43 to the west, by Iona Avenue to the south, by Houston Avenue to the north, and by a ditch to the east. This area would service the H alignment. The CS5 site is within a proposed HMF footprint and consists of two parcels of agricultural land with a total of 124 acres.

Feasibility

This site consists of two parcels of agricultural land with a total of 124 acres. The only impact to the area would be the loss of agricultural land. This site is easily accessible because of its proximity to Golden State Highway 43.

Meets Each Criteria

Site CS5 is in a rural agricultural area, and should have minimal interference with pedestrians, bicyclists, and transit. The HST right-of-way intersects the site and therefore would allow access to the construction site and to construction roads. SR 43 runs almost parallel and SR 198 is approximately 2 miles away; these highways would provide favorable access for the delivery of materials and equipment to and from the staging site. The proposed site access would be via SR 43, and there would be no proposed road closures. The site is approximately 124 acres. The site does not encroach on any floodplains or environmentally sensitive areas.

General Size, Shape, and Location

The 124-acre site is rectangular and is ideally located for use as a staging area for construction materials and equipment.

Site Summary

Site CS5 is adequate in size and is located near future construction areas. The site is in the HST right-of-way and would provide access to service roads and to construction areas.

F. SITE CS9

General Location

Site CS9 is in the city of Wasco and is bounded by Paso Robles Highway to the north, by Wasco Avenue to the west, by Paso Avenue to the south, and by a farm road about 1,000 feet east of Wasco Avenue to the east. This site is a proposed HMF location.

Feasibility

The proposed site is currently agricultural land, and an actively used rail yard is in the immediate vicinity; this rail yard would not be taken over but might be used for the transportation of materials and equipment. The topography is flat and no parcels of land would need to be purchased if the HMF were located at this site. The site is close to other businesses and dwellings; this proximity would make noise and dust control important considerations. A factor affecting the feasibility of this site would be the potential increase in the traffic volume of SR 43, which provides access to nearby urban developments.

Meets Each Criteria

Proposed construction access to CS6 would be via Wasco Avenue and via 6th Street from north- and southbound SR 43, respectively. There are no proposed road closures. Access roads would likely need to be repaired or refinished upon the completion of construction because the wear on the existing roadway elements would be excessive. The site meets the minimum area requirement plus additional work area. The staging area would be along SR 43, which runs parallel to the proposed viaduct alignment and provides access to construction service roads. The staging area is within the proposed maintenance facility footprint, so no additional land acquisitions would be necessary. No documented environmentally sensitive areas or floodplains are in the immediate area.

General Size, Shape, and Location

The proposed staging yard would lie within the proposed rectangular maintenance facility footprint and would total approximately 91 acres. Proximity to urban developments is a negative characteristic of this site.

Site Summary

Site CS9 is adequate in size. No buildings would be demolished and no occupants of dwellings would be relocated. No land acquisitions in excess of the proposed maintenance facility would be necessary. The site is adjacent to the HST right-of-way and would provide access to service roads and to construction areas.

G. SITE CS10

General Location

Site CS10 is approximately 4.5 miles south of the city of Shafter and within a proposed HMF footprint. The site is bounded by Santa Fe Way/S. Central Valley Highway to the southwest, by S. Burbank Street to the north, and by Driver Road to the east. The alignment considered for this site is WS2.

Feasibility

This site would not require the purchase of land in excess of the proposed HMF footprint. No demolition of structures or relocation of occupants would be required. Construction access would be via Weidenbach Street from southbound Santa Fe Way/S. Central Valley Highway and via Nord Avenue onto Fanucchi Way East from northbound Santa Fe Way/S. Central Valley Highway.

Meets Each Criteria

The site is in an undeveloped area, and utilities would likely need to be brought to the site. There are developments within 1 mile of CS10 (a Target distribution center), so the necessary utilities would presumably come from about 1 mile away. The site meets the minimum area requirement, has additional work area, and is near extended sections of precast viaduct.

Site CS10 2-B runs parallel to Santa Fe Way/S. Central Valley Highway, a major roadway that would provide favorable access for shipping and receiving of materials. Also, the site is parallel to the HST right-of-way and would allow access to construction side roads. The proposed footprint does not encroach on any documented environmentally sensitive areas.

General Size, Shape, and Location

Site CS10 is approximately 140 acres and is composed of multiple parcels of land. This proposed location would be large enough to accommodate both precasting and construction staging.

Site Summary

Site CS10 is favorable in that it is located along the HST right-of-way, is within a proposed HMF footprint, is close to long spans of viaduct and to a major highway, and has adequate workspace for both precasting and construction staging.

5.4.13 Construction Laydown Areas

A. CRITERIA

The Construction Laydown Areas are different from Construction Staging Areas in that they are required for a short period to construct large steel truss bridges over major highways and waterways. In contrast to the precasting and construction staging locations, the Construction Laydown Areas identified in this report are determined by the location of the steel truss structures, and therefore the same criteria cannot be used to assess these locations. The criteria for the Construction Laydown Areas are size and accessibility.

Accessibility

The selected locations need to be easily accessible to transport the large steel members to their erection sites.

Size

The temporary Construction Laydown Areas should be between 15 and 25 acres, to provide the contractor with sufficient space to erect the steel bridge structures.

B. CL1

General Location

Site CL1 is in the city of Fresno and is the Construction Laydown Area for the steel structure over S. Golden State Boulevard and S. Railroad Avenue.

Accessibility

The site is south of Downtown Fresno, and the area is mainly composed of industrial businesses. One parcel of land on either side of S. Golden State Boulevard would need to be acquired on a temporary basis, using a fixed-term lease agreement, until the construction of the bridge is complete. The proposed construction access roads for CL1 are S. Orange Avenue and S. Railroad Avenue. Pearl Harbor Survivors Memorial (SR 99) is nearby, and the E. Jenson Avenue exit should be used to access both sides of the site. No road closures would be necessary for this site.

Size

CL1 is 23 acres. A large industrial building on the west side of S. Golden State Boulevard can be avoided, but there will be negative impacts on the business's access from a reduction in available parking and from the loss of the use of a building. Four additional buildings on the east side of S. Golden State Boulevard would also need to be acquired. Demolition of buildings should be avoided for these temporary laydown areas.

5.5 Mitigation Measures

5.5.1 Proposed Project Mitigations

This section summarizes the measures that will mitigate significant impacts from the estimated addition of project-related traffic. These mitigation measures are identified based on traffic operations and on a conceptual-level evaluation of improved intersection lane geometry and traffic controls that will improve the level of service.

The feasibility of completing each measure will depend on further design work to evaluate specific roadway geometrics during the project's final design. In addition, many intersections and roadways are already operating at unacceptable conditions or will be in the future without the project. The HST project would contribute additional traffic to the unacceptable conditions at the intersections identified in the list below, but the project is not fully responsible for improving an intersection that is already operating below acceptable criteria.

Because these intersections and roadway segments already experience congestion and future operating conditions under the No Project Alternative would also be unacceptable, the Authority will implement mitigation measures as described below.

5.5.2 Existing plus Project Mitigations

A. FRESNO STATION AREA

- SR 99 northbound ramps/Ventura Avenue (6): Re-stripe the northbound approach to provide one exclusive left-turn lane and one shared through/right-turn lane at the intersection.

- Divisadero Street/SR 41 northbound ramps/Tulare Street (33-0): Re-time the existing signal.
- H Street/Divisadero Street (63): Re-time the existing signal in the a.m.
- N. Blackstone Avenue/CA 180 westbound ramps (80): Re-time the existing signal in the a.m.

B. KINGS/TULARE REGIONAL STATION AREA

- Seventh Street/SR 198 (4): Install a traffic signal at the intersection.
- Sixth Street/SR 198 (6): Install a traffic signal at the intersection.
- Second Avenue/SR 198 (7): Install a traffic signal at the intersection.
- SR 43/Lacey Boulevard (8): Install a traffic signal at the intersection.
- SR 198 between 7th Avenue and 6th Avenue: Add one lane in either direction.
- SR 198 between 6th Avenue and 2nd Avenue: Add one lane in either direction.
- SR 198 between 2nd Avenue and Road 48: Add one lane in either direction.

C. BAKERSFIELD STATION AREA

- S. Union Avenue/eastbound SR 58 ramps (1): Re-stripe the eastbound approach to provide one exclusive left-turn lane and one shared left- or right-turn lane at the intersection.
- SR 99 northbound ramps/California Avenue (15): Re-stripe the northbound approach to provide one exclusive left-turn lane, one shared left- or right-turn lane, and one exclusive right-turn lane at the intersection.
- Hayden Court/Union Avenue (29): Re-time the existing signal in the a.m. (only the Bakersfield Station–South Alternative in the a.m.)
- Union Avenue/Golden State Avenue/Twenty-first Street (41): Re-time the existing signal in the p.m.

Mitigated level-of-service analysis and results for the study intersections and roadway segments under Existing plus Project Conditions are illustrated in Table 5.5-1. Also the Synchro Output for mitigation analysis is provided in Appendix H (Mitigation Synchro Output).

Table 5.5-1
Level-of-Service Summary Analysis for Mitigated Study Intersections under Existing plus Project Conditions

Study Intersection	AM Peak		PM Peak	
	Delay (s)	LOS	Delay (s)	LOS
Fresno Station				
SR 99 Northbound Ramps/Ventura Ave.	123.7	F	33.5	D
Divisadero St./SR 41 NB Ramps/Tulare St.	65.6	E	194.5	F
H St./Divisadero St.	73.0	E	34.6	C
N. Blackstone Ave./CA 180 Westbound Ramps	165.1	F	18.2	B
Kings/Tulare Regional Station				
7th St./SR 198	10.2	B	7.8	A
6th St./SR 198	7.3	A	7.7	A

Table 5.5-1
Level-of-Service Summary Analysis for Mitigated Study Intersections under Existing plus Project Conditions

Study Intersection	AM Peak		PM Peak	
	Delay (s)	LOS	Delay (s)	LOS
2nd Ave./SR 198	6.7	A	7.7	A
SR 43/Lacey Blvd.	6.6	A	10.4	B
Bakersfield Station				
S. Union Ave./Eastbound SR 58 Ramps	157.0	F	11.1	B
SR 99 Ramps/California Ave.	52.4	D	29.1	C
Hayden Court/Union Ave. (only the Bakersfield Station–South Alternative in the a.m.)	48.2	D	30.6	C
Union Ave./Golden State Ave./21st St.	27.6	C	88.3	F
Acronyms: LOS = level of service SR = State Route				

5.5.3 Future plus Project Mitigations

A. FRESNO STATION AREA

- Van Ness Avenue/SR 41 northbound ramp (2): Re-stripe the eastbound approach to provide one exclusive left-turn lane and one shared left-turn/through/right-turn lane at the intersection.
- SR 99 northbound ramps/Ventura Avenue (6): Install a traffic signal at the intersection.
- E Street/Ventura Avenue (7): Install traffic signal at the intersection.
- Van Ness Avenue/Ventura Street (10): Modify the existing traffic-signal phasing to provide protected left-turn phases for the northbound and southbound approaches.
- H Street/Kern Street (21): Widen the eastbound approach to provide one exclusive left-turn lane and one exclusive right-turn lane at the intersection.
- G Street/Tulare Street (24): Modify the existing traffic-signal phasing to provide protected left-turn phases for the eastbound and westbound approaches. In addition, the westbound approach will need to be widened to provide one exclusive left-turn lane, one exclusive through lane, and one exclusive right-turn lane at the intersection.
- H Street/Tulare Street (25): Widen the southbound approach to provide one exclusive left-turn lane, two through lanes and one exclusive right-turn lane. Also, widen the northbound approach to provide two exclusive left-turn lanes, one exclusive through lane, and one shared through/right-turn lane. In addition, the westbound approach will also need to be widened to provide one exclusive left-turn lane, two through lanes, and one shared through/right-turn lane at the intersection.

- Van Ness Avenue/Tulare Street (26): Widen the westbound approach to provide one exclusive left-turn lane, two through lanes, and one exclusive right-turn lane at the intersection.
- U Street/Tulare Street (30): Modify the existing traffic-signal phasing to provide protected left-turn phases for the eastbound and westbound approaches.
- SR 99 southbound ramps/Fresno Street (37): Widen the eastbound approach to provide two exclusive through lanes and one exclusive right-turn lane at the intersection.
- SR 99 northbound ramps/Fresno Street (38): Re-stripe the eastbound approach to provide two exclusive left-turn lanes and one exclusive through lane.
- Van Ness Avenue/Fresno Street (42): Widen the southbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one exclusive right-turn lane at the intersection.
- Fresno Street/Divisadero Street (46): Modify the existing traffic signal to provide split phases for the eastbound and westbound approaches at the intersection.
- H Street/Amador Street (60): Install a traffic signal at the intersection.
- H Street/Divisadero Street (63): Widen the westbound approach to provide one shared through/right-turn lane and three exclusive right-turn lanes. Re-stripe the northbound approach to provide two exclusive left-turn lanes and one shared through/right-turn lane. Also, provide an additional left-turn lane on the southbound approach (H Street).
- Van Ness Avenue/Divisadero Street (66): Widen the eastbound and westbound approaches to provide one shared through/left-turn lane, one exclusive through lane, and one exclusive right-turn lane at the intersection.
- H Street/Roosevelt Street (67): Re-stripe the eastbound approach (H Street) to provide one shared through/left-turn lane, one exclusive through lane, and one shared through/right-turn lane.
- N. Blackstone Avenue/E. McKenzie Avenue (68): Widen the westbound approach to provide one exclusive left-turn lane and one exclusive through lane.
- Van Ness Avenue/SR 180 eastbound ramps (71): Re-stripe the northbound approach to provide one exclusive through lane, one shared through/right-turn lane, and one exclusive right-turn lane at the intersection.
- Van Ness Avenue/SR 180 westbound ramps (73): Widen the eastbound approach to provide one additional exclusive left-turn lane at the intersection.
- N. Blackstone Avenue/E. Belmont Avenue (74): Widen the southbound approach to provide one exclusive left-turn lane, two exclusive through lanes, and one shared through/right-turn lane at the intersection.
- N. Abby Street/SR 180 eastbound ramps (79): Re-stripe the northbound approach to provide one shared through/left-turn lane, one exclusive through lane, one shared through/right-turn lane, and one exclusive right-turn lane at the intersection.
- N. Blackstone Avenue/SR 180 westbound ramps (80): Widen the eastbound approach to provide one additional exclusive right-turn lane at the intersection.

- Broadway Street/Amador Street (81): Install a traffic signal at the intersection.
- S. Van Ness Avenue/E. California Avenue (92): Install a traffic signal at the intersection; in addition, provide exclusive left-turn lanes in both northbound and southbound directions, and change phasing on the northbound left and southbound left to protected plus permissive.
- S. Golden State Boulevard/E. Church Avenue (96): Provide an exclusive right-turn lane in the northbound direction, and change signal phasing on all approaches to provide a protected plus permissive left-turn phase.
- S. East Avenue/E. Church Avenue (98): Install a traffic signal at the intersection.
- S. Sunland Avenue/E. Church Avenue (99): Install a traffic signal at the intersection.
- S. East Avenue/S. Golden State Boulevard (101): Increase cycle length in the PM Peak Hour, only.
- S. Golden State Boulevard/E. Jensen Avenue (102): Provide an exclusive right-turn lane for both northbound and southbound approaches.
- Tulare Street, between Broadway Street and Van Ness Avenue: Add one lane in either direction.
- Divisadero Street, between N. Fresno Street and SR 41 ramps: Add one lane in either direction.

B. KINGS/TULARE REGIONAL STATION AREA

- Ninth Avenue/SR 198 (1): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches.
- Eighth Avenue/SR 198 westbound ramps (2): Install a traffic signal at the intersection.
- Eighth Avenue/SR 198 eastbound ramps (3): Install a traffic signal at the intersection.
- Seventh Street/SR 198 (4): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- Sixth Street/SR 198(6): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- Second Avenue/SR 198 (7): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- SR 43/Lacey Boulevard (8): Install a traffic signal at the intersection to provide protected left-turn phases for the northbound and southbound approaches along with split phasing for the eastbound and westbound approaches.
- Eighth Avenue/SR 43 between Grangeville Boulevard and SR 198 ramps: Add one lane in either direction.

C. BAKERSFIELD STATION AREA

- S. Union Avenue/Eastbound SR 58 ramps (1): Re-stripe the eastbound approach to provide one exclusive left-turn lane and one shared left-turn/right-turn lane at the intersection.
- Union Avenue/E. Brundage Lane (6): Widen the westbound approach to provide an additional exclusive left-turn lane at the intersection.
- Liggett Street/E. Brundage Lane (7): Widen the northbound approach to provide an additional exclusive left-turn lane. In addition, the existing traffic signal will need to be modified to provide protected left-turn phases on the eastbound and westbound approaches.
- P Street/Eighth Street (13): Install a traffic signal at the intersection.
- SR 99 northbound ramps/California Avenue (15): Re-stripe the northbound approach to provide one exclusive left-turn lane, one shared left-turn/through/right-turn lane, and one exclusive right-turn lane at the intersection.
- Oak Street/California Avenue (16): Modify the existing traffic signal to provide protected left-turn phases for the northbound and southbound approaches at the intersection.
- Union Avenue/California Avenue (23): Widen the northbound approach to provide one exclusive left-turn lane, three exclusive through lanes, and one exclusive right-turn lane at the intersection.
- Oak Street/Truxtun Avenue (30): Re-stripe the westbound approach to provide two exclusive left-turn lanes, two exclusive through lanes, and one shared through/right-turn lane at the intersection.
- Union Avenue/Golden State Avenue/21st Street (41): Widen the northbound approach to provide an additional through lane continue on Union Avenue.
- Q Street/Golden State Avenue (51): Widen the eastbound approach to provide an additional exclusive left-turn lane at the intersection.
- M Street/Twenty-eighth Street/Golden State Avenue (56): Widen the northbound approach to provide an additional exclusive left-turn lane at the intersection.

Figures 5.5-1 through 5.5-3 show the mitigation measures at the intersections in the Fresno Station area, the Kings/Tulare Regional Station area, and the Bakersfield Station area, respectively.

Mitigated level-of-service analysis and results for the study intersections and roadway segments under Future plus Project Conditions are illustrated in Table 5.5-2 and Table 5.5-3. The Synchro Output for mitigation analysis is provided in Appendix H (Mitigation Synchro Output).

Table 5.5-2
Level-of-Service Summary Analysis for Mitigated Study Intersections under Future plus Project Conditions

Study Intersection	AM Peak		PM Peak	
	Delay (s)	LOS	Delay (s)	LOS
Fresno Station				
Van Ness Ave./SR 41 Northbound Ramp	20.6	C	19.6	C
SR 99 Northbound Ramps/Ventura Ave.	26.6	C	73.9	E
E St./Ventura Ave.	8.2	A	126.6	F
Van Ness Ave./Ventura St.	35.3	D	66.3	E
H St./Kern St.	24.3	C	26.3	D
G St./Tulare St.	43.4	D	232.1	F
H St./Tulare St.	14.6	B	49.7	D
Van Ness Ave./Tulare St.	27.5	C	132.7	F
U St./Tulare St.	17.6	B	68.7	E
SR 99 Southbound Ramps/Fresno St.	41.6	D	95.4	F
SR 99 Northbound Ramps/Fresno St.	34.1	C	122.1	F
Van Ness Ave./Fresno St.	29.4	C	57.9	E
Fresno St./Divisadero St.	40.7	D	114.4	F
H St./Amador St.	5.4	A	13.7	B
Divisadero St./N. Echo St.	101.7	F	183.7	F
Van Ness Ave./Divisadero St.	18.0	B	57.7	E
N Roosevelt Ave./H St.	13.1	B	92.5	F
N Blackstone Ave./E McKenzie Ave.	10.4	B	31.4	C
Van Ness Ave./SR 180 Eastbound Ramps	30.8	C	65.0	E
Van Ness Ave./SR 180 Westbound Ramps	13.8	B	20.0	B
N. Blackstone Ave./E Belmont Ave.	67.4	E	155.9	F
N. Abby St./SR 180 Eastbound Ramps	13.4	B	26.6	C
N. Blackstone Ave./SR 180 Westbound Ramps	46.3	D	160.5	F
Broadway St./Amador St.	3.9	A	1144.6	F
S. Van Ness Ave./E. California Ave.	12.9	B	49.7	D
S. Golden State Blvd./E. Church Ave.	50.3	D	158.9	F
S. East Ave./E. Church Ave.	10.4	B	25.2	C
S. Sunland Ave./E. Church Ave.	5.2	A	5.1	A
S. East Ave./S. Golden State Blvd.			19.9	B
S. Golden State Blvd./E. Jensen Ave.	110.0	F	308.5	F
Kings/Tulare Regional Station				
9th Ave./SR 198	18.4	B	59.2	E
8th Ave./SR 198 Westbound Ramps	5.8	A	7.6	A
8th Ave./SR 198 Eastbound Ramps	7.0	A	10.6	B
7th St./SR 198	19.4	B	22.7	C
6th St./SR 198	14.7	B	15.9	B
2nd Ave./SR 198	14.1	B	15.2	B
SR 43/Lacey Blvd.	19.7	B	41.0	D

Table 5.5-2
Level-of-Service Summary Analysis for Mitigated Study Intersections under Future plus Project Conditions

Study Intersection	AM Peak		PM Peak	
	Delay (s)	LOS	Delay (s)	LOS
Bakersfield Station				
S. Union Ave./Eastbound SR 58 Ramps	68.4	E	21.1	C
S. Union Ave./E. Brundage Ln.	35.5	D	52.0	D
Liggett St. and E. Brundage Ln.	42.2	D	37.6	D
P St./8th St.	5.4	A	6.9	A
SR 99 Ramps/California Ave.	19.3	B	30.7	C
Oak St./California Ave.	32.8	C	59.5	E
Union Ave./California Ave.	34.7	C	65.3	E
Oak St./Truxtun Ave.	57.3	E	144.8	F
Union Ave./Golden State Ave./21st St.	35.7	D	75.6	E
Q St./Golden State Ave.	22.5	C	118.0	F
M St./28th St./Golden State Ave.	121.4	F	255.5	F

LOS = level of service
SR = State Route

Table 5.5-3
Level-of-Service Summary Analysis for Mitigated Roadway Segments under Future plus Project Conditions

Roadway Segment	# of Lanes	Divided/ Undivided	ADT	LOS
Fresno Station				
Tulare St., between Broadway St. and Van Ness Ave.	3/3	Divided	31,640	D
Divisadero St., between N. Fresno St. and SR 41 Ramps	3/3	Divided followed by Undivided	29,860	D
Kings/Tulare Regional Station				
8th Ave./SR 43 between Grangeville Blvd. and SR 198 Ramps	2/2	Undivided	14,960	D

Acronyms:
ADT = average daily traffic
LOS = level of service
SR = State Route

D. HEAVY MAINTENANCE FACILITY SITE MITIGATIONS

Given that these intersections and roadway segments already experience congestion and that future operating conditions under the No Project Alternative would also be unacceptable, the Authority will implement the following mitigation measures:

5.5.4 Existing plus Project Mitigations

A. FRESNO WORKS–FRESNO HMF SITE AREA

- SR 99 southbound off-ramp/E. Central Avenue (2): Install a traffic signal at the intersection.
- S. Clovis Avenue/SR 99 southbound on-ramp (11): Install a traffic signal at the intersection.

B. KERN COUNCIL OF GOVERNMENTS–WASCO HMF SITE AREA

- Wasco Avenue/Paso Robles Highway (SR 46) (1): Install a traffic signal at the intersection.

Mitigated level-of-service analysis and results for the study intersections under Existing plus HMF Conditions are illustrated in Table 5.5-4. The Synchro Output for mitigation analysis is provided in Appendix H (Mitigation Synchro Output).

Table 5.5-4
Level-of-Service Summary Analysis for HMF Mitigated Study Intersections under Existing plus Project Conditions

Study Intersection	AM Peak Delay (s)	AM Peak LOS	PM Peak Delay (s)	PM Peak LOS
Fresno Works-Fresno				
SR 99 SB off-ramp/E. Central Ave.	15.3	B	8.8	A
Clovis Ave./SR 99 SB on-ramp	5.9	A	7.3	A
Kern Council of Governments –Wasco				
Wasco Ave./Paso Robles Hwy	7.4	A	7.4	A

Acronyms:
HMF = heavy maintenance facility
Hwy = highway
LOS = level of service
SR = State Route

5.5.5 Future plus Project Mitigations

A. FRESNO WORKS–FRESNO HMF SITE AREA

- SR 99 southbound off-ramp/E. Central Avenue (2): Install a traffic signal at the intersection.
- SR 99 southbound off-ramp/E. American Avenue (6): Install a traffic signal at the intersection.
- S. Clovis Avenue/SR 99 southbound on-ramp (11): Install a traffic signal at the intersection.

B. KINGS COUNTY–HANFORD HMF SITE AREA

- Central Valley Highway (SR 43)/Houston Avenue (1): Change eastbound and westbound phasing from split to permissive.
- Central Valley Highway (SR 43)/Idaho Avenue (3): Install a traffic signal at the intersection.
- On SR 43 between SR 198 and Houston Avenue: Add one lane in either direction.

C. KERN COUNCIL OF GOVERNMENTS–WASCO HMF SITE AREA

- Wasco Avenue/Paso Robles Highway (SR 46) (1): Install a traffic signal at the intersection.

D. KERN COUNCIL OF GOVERNMENTS–SHAFTER HMF SITE AREA

- Santa Fe Way/Burbank Street (1): Install a traffic signal at the intersection
- On Santa Fe Way between Burbank Street and 7th Standard Road: Add one lane in either direction

Figures 5.5-4 through 5.5-7 show the mitigation measures at the intersections for the Fresno, Hanford, Wasco, and Shafter HMF site alternative areas, respectively. Mitigated level-of-service analysis and results for the study intersections and roadway segments under Future plus HMF Conditions are illustrated in Table 5.5-5 and Table 5.5-6. The Synchro output for mitigation analysis is provided in Appendix H (Mitigation Synchro Output).

Table 5.5-5
Level-of-Service Summary Analysis for HMF Mitigated Study Intersections under Future plus Project Conditions

Study Intersection	AM Peak Delay(s)	AM Peak LOS	PM Peak Delay(s)	PM Peak LOS
Fresno Works–Fresno				
SR 99 SB off-ramp/E. Central Ave.	15.3	B	13.4	B
SR 99 SB off-ramp/E. American Ave.	6.9	A	11.3	B
Clovis Ave./SR 99 SB on-ramp	16.8	B	15	B
Kings County– Hanford				
Central Valley Hwy/Houston Ave.	18.2	B	22.9	C
Central Valley Hwy/Idaho Ave.	3.5	A	4.8	A
Kern Council of Governments–Wasco				
Wasco Ave./Paso Robles Hwy	23.5	C	65.1	E
Kern Council of Governments–Shafter				
Santa Fe Way/Burbank St.	11	B	10.5	B

Acronyms:
HMF = heavy maintenance facility
LOS = level of service
SR = State Route

Table 5.5-6
Level-of-Service Summary Analysis for HMF Mitigated Roadway Segments under Future plus HMF Conditions

Roadway Segment	# of Lanes	Divided/ Undivided	ADT	LOS
Kings County–Hanford				
SR 43, between SR 198 and Houston Ave.	2/2	Undivided	15,843	D
Kern Council of Governments–Shafter				
Santa Fe Way, between Burbank St. and 7th Standard Rd.	2/2	Undivided	26,298	D

Acronyms:
ADT = average daily traffic
HMF = heavy maintenance facility
LOS = level of service
SR = State Route

E. CORCORAN MITIGATIONS

5.5.6 Future plus Project Mitigations

- Whitley Avenue/Pickerell Avenue (3): Install a traffic signal at the intersection.

Mitigated level-of-service analysis and results for the study intersections under Future plus Project Conditions are illustrated in Table 5.5-7. The Synchro output for mitigation analysis is provided in Appendix H (Mitigation Synchro Output).

Table 5.5-7
Level-of-Service Summary Analysis for Mitigated Study Intersections under Future plus Project Conditions

Study Intersection	AM Peak Delay(s)	LOS	PM Peak Delay(s)	LOS
Corcoran				
Whitley Ave./Pickerell Ave.	7.3	A	8.6	A

Acronym:
LOS = level of service

Figure 5.5-8 shows the mitigation measures at the intersections in the Corcoran area.

A. CONSTRUCTION MITIGATION

Fresno Station Area

- N. Blackstone Avenue/SR 180 westbound ramps (80): Widen the eastbound approach to provide one additional exclusive right-turn lane at the intersection.

Kings/Tulare Regional Station Area

- Seventh Street/SR 198 (4): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- Sixth Street/SR 198(6): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- Second Avenue/SR 198 (7): Install a traffic signal at the intersection to provide protected left-turn phases for the eastbound and westbound approaches along with split phasing for the northbound and southbound approaches.
- SR 43/Lacey Boulevard (8): Install a traffic signal at the intersection to provide protected left-turn phases for the northbound and southbound approaches along with split phasing for the eastbound and westbound approaches.

Bakersfield Station Area

- S. Union Avenue/eastbound SR 58 ramps (1): Re-stripe the eastbound approach to provide one exclusive left-turn lane and one shared left-turn/right-turn lane at the intersection.

B. SIGNAL WARRANT SUMMARY

The signal warrant analysis is done by installing signals at the intersections as the proposed mitigation. Table 5.5-8 summarizes the signal warrant analysis for the study intersections in the station area and HMF locations under Existing plus Project and Future plus Project Conditions.

Table 5.5-8
Signal Warrant Summary

Int. #	Intersection Name	Warrant Met
Existing plus Project – Hanford Station		
4	7th St./SR 198	Yes
6	6th St./SR 198	Yes
7	2nd Ave./SR 198	No
8	SR 43/Lacey Blvd.	Yes
Future plus Project – Fresno Station		
6	SR 99 Northbound Ramps/Ventura Ave.	Yes
7	E St./Ventura Ave.	Yes
60	H St./Amador St.	Yes
81	Broadway St./Amador St.	Yes
92	S. Van Ness Ave./E. California Ave.	Yes
98	S. East Ave./E. Church Ave.	Yes
99	S. Sunland Ave./E. Church Ave.	No

Table 5.5-8
Signal Warrant Summary

Int. #	Intersection Name	Warrant Met
Future plus Project – Hanford Station		
1	9th Ave./SR 198	Yes
2	8th Ave./SR 198 Westbound Ramps	Yes
3	8th Ave./SR 198 Eastbound Ramps	Yes
4	7th St./SR 198	Yes
6	6th St./SR 198	Yes
7	2nd Ave./SR 198	Yes
8	SR 43/Lacey Blvd.	Yes
Future plus Project – Bakersfield Station		
13	P St./8th St.	Yes
Existing plus Project – Fresno HMF		
2	SR 99 SB Off-Ramp/E. Central Ave.	Yes
11	S. Clovis Ave./SR 99 SB On-Ramp	Yes
Existing plus Project – Wasco HMF		
1	Wasco Ave./Paso Robles Hwy (SR 46)	Yes
Future plus Project – Fresno HMF		
2	SR 99 SB Off-Ramp/E. Central Ave.	Yes
6	SR 99 SB Off-Ramp/E. American Ave.	Yes
11	S. Clovis Ave./SR 99 SB On-Ramp	Yes
Future plus Project – Hanford HMF		
3	Central Valley Highway (SR 43)/ Idaho Ave.	No
Future plus Project – Wasco HMF		
1	Wasco Ave./Paso Robles Hwy (SR 46)	Yes
Future plus Project – Shafter HMF		
1	Santa Fe Way/Burbank St.	Yes

Chapter 6
References

6.0 References

6.1 Documents and Websites

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6.2 Persons and Agencies Consulted

Arias, David, Transportation Engineer, Traffic Operations, Caltrans. Numerous phone conversations and emails exchanged; have maintained contact from February 2010 to March 2010. Regarding signal timings for the City of Fresno.

Audino, Rachel, Regional Planner, Kings County Association of Governments. Numerous phone conversations and emails exchanged, and have maintained contact from February 2010 to March 2010. Regarding Travel Demand Model for Kings County.

Ball, Robert, Senior Planner, Kern County, Kern Council of Governments. Numerous phone conversations and emails exchanged; have maintained contact from December 2009 to April 2010. Regarding Travel Demand Model for the City of Bakersfield.

Bitner, Mike, Principal Planner, Council of Fresno County Governments, City of Fresno. Phone conversation and emails exchanged; have maintained contact from December 2009 to January 2010. Regarding Travel Demand Model for the City of Fresno.

Chahal, Mandeep, Engineering Technician II, Traffic Operation Center, Public Works Department, City of Fresno. Numerous phone conversations and emails exchanged; have maintained contact from February 2010 to April 2010. Regarding parking information from the City of Fresno.

Edmiaston, Royce, Kern County. Numerous emails exchanged and have maintained contact from December 2009 to January 2010. Regarding signal timings for the City of Bakersfield.

Jones, Bryan, City Traffic Engineer/Traffic Engineering Division Manager, City of Fresno Public Works Department. Numerous phone conversations and emails exchanged; have maintained contact from October 2009 to November 2009. Regarding study intersections and roadway segments for the City of Fresno.

Nieneke, Barry, Kern County. Numerous emails exchanged and have maintained contact from December 2009 to January 2010. Regarding signal timings for the City of Bakersfield.

Reyes, Jacki, Claims Officer, Caltrans District 4. Numerous phone conversations and emails exchanged; have maintained contact from December 2009 to April 2010. Regarding signal timings for the City of Bakersfield and City of Fresno.

Rojas, Raul, Public Works Director, City of Bakersfield. Numerous emails exchanged and have maintained contact from November 2009 to December 2009. Regarding study intersections and roadway segments for the City of Bakersfield.

Underwood, Brad, Assistant Public Works Director, City of Bakersfield. Numerous emails exchanged and have maintained contact from November 2009 to December 2009. Regarding study intersections and roadway segments for the City of Bakersfield.

Wenino, Gary, Kern County. Numerous emails exchanged and have maintained contact from December 2009 to January 2010. Regarding signal timings for the City of Bakersfield.

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Chapter 7
List of Preparers

7.0 List of Preparers

The following individuals have made significant contributions to the development of this technical report:

Nayan Amin Project Manager Transportation Task Manager	M.S., Civil Engineering, San Jose State University; B.S., Civil Engineering, Saurashtra University, India; Registered Traffic Engineer. 20 years of experience.
Ruta Jariwala Project Manager Transportation Project Engineer	M.S., Civil Engineering, San Jose State University; B.S., Civil Engineering, Mumbai University, India; California Registered Civil Engineer and Traffic Engineer. 10 years of experience.
Swathi Korpu Graduate Transportation Engineer Technical Staff	M.S., Civil Engineering, Clemson University; B.S., Civil Engineering, Jawaharlal Nehru Technological University, India; Certified Engineer-In-Training. 2 years of experience
Rutvij Patel Transportation Intern Transportation Support Staff	B.S., Civil Engineering, San Jose State University. 2 years of experience.
Beshoy Demyan Graduate Transportation Engineer Transportation Support Staff	B.S., Civil Engineering, San Jose State University; Certified Engineer-In-Training. 2 years of experience.
Prashanth Dullu Graduate Transportation Engineer Transportation Support Staff	M.S., Civil Engineering, University of Alabama, Huntsville; B.S., Civil Engineering, Deccan College of Engineering and Technology, India. 2 years of experience.

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Figures
(for Chapters 4 and 5)